

Appendix K
Cardiovascular Assessment

TABLE K-1.
Summary of Dioxin-by-Covariate Interactions for
Cardiovascular Variables

Ranch Hands - Log2 (Initial Dioxin)									
Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Percent Yes	Adj. Relative Risk (95% C.I.) ^a	p-Value		
Reported/ Verified Essential Hypertension (Maximal-- 12-3 [d])	Initial-by- Differential Cortisol Response	≤ 0.6	Low	45	35.6	1.17 (0.94,1.44)	0.157		
			Medium	107	41.1				
			High	56	50.0				
	$>0.6-4.0$	$>0.6-4.0$	Low	63	23.8	0.95 (0.77,1.18)	0.645		
			Medium	110	38.2				
			High	59	32.2				
	>4.0	>4.0	Low	55	34.6	0.90 (0.67,1.20)	0.459		
			Medium	92	31.5				
			High	30	43.3				
Ranch Hands and Comparisons by Current Dioxin Category									
Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Percent Yes	Contrast	Adj. Relative Risk (95% C.I.)	p-Value	
Reported/ Verified Essential Hypertension (12-3 [j])	Categorized Current Dioxin-by- Age	Born ≥ 1942	Background	299	24.4	A11		0.021	
			Unknown	111	15.3	U vs. B	0.68 (0.37,1.23)	0.202	
			Low	76	32.9	L vs. B	1.66 (0.94,2.93)	0.078	
			High	103	36.9	H vs. B	1.56 (0.95,2.56)	0.082	
			Background	397	38.8	A11		0.998	
			Unknown	204	34.3	U vs. B	0.98 (0.68,1.42)	0.920	
	Born < 1942		Low	97	41.2	L vs. B	1.01 (0.63,1.62)	0.967	
			High	47	46.8	H vs. B	1.09 (0.57,2.05)	0.802	

TABLE K-1. (Continued)**Summary of Dioxin-by-Covariate Interactions for
Cardiovascular Variables****Ranch Hands - Log2 (Initial Dioxin)**

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Percent Yes	Adj. Relative Risk (95% C.I.) ^a	p-Value
Reported Heart Disease (Excluding Essential Hypertension) (Minimal-- 12-4 [c])	Initial-by- Race	Black	Low	10	70.0	0.27 (0.08,0.92)	0.036
			Medium	13	46.2		
			High	3	33.3		
	Initial-by- Race	Non-Black	Low	100	40.0	0.99 (0.82,1.18)	0.879
			Medium	211	34.1		
			High	109	29.4		
Verified Heart Disease (Excluding Essential Hypertension) (Minimal-- 12-5 [c])	Initial-by- Race	Black	Low	10	70.0	0.27 (0.08,0.89)	0.032
			Medium	13	46.2		
			High	3	33.3		
	Initial-by- Race	Non-Black	Low	100	40.0	0.99 (0.83,1.19)	0.920
			Medium	211	33.7		
			High	109	29.4		

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Percent Yes	Contrast	Adj. Relative Risk (95% C.I.)	p-Value
Reported/ Verified Myocardial Infarction (12-6 [j])	Categorized Current Dioxin-by- Differential Cortisol Response	≤ 0.6	Background	236	3.0	All		<0.001
			Unknown	93	3.2	U vs. B	0.83 (0.20,3.35)	0.793
			Low	61	14.8	L vs. B	6.43 (2.21,18.68)	0.001
			High	55	0.0	H vs. B	--	0.454
	>0.6-4.0	Background	Background	228	4.4	All		0.721
			Unknown	102	2.0	U vs. B	0.47 (0.10,2.22)	0.339
			Low	63	3.2	L vs. B	0.67 (0.14,3.27)	0.619
			High	61	1.6	H vs. B	0.52 (0.21,1.30)	0.164
	>4.0	Background	Background	203	7.4	All		0.364
			Unknown	108	3.7	U vs. B	0.54 (0.17,1.69)	0.289
			Low	50	2.0	L vs. B	0.28 (0.04,2.24)	0.231
			High	34	5.9	H vs. B	1.34 (0.53,3.34)	0.535

TABLE K-1. (Continued)
Summary of Dioxin-by-Covariate Interactions for
Cardiovascular Variables

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Adj. Mean	Adj. Slope (Std. Error) ^b	p-Value
Systolic Blood Pressure (Continuous) (Minimal-- 12-7 [c])	Initial-by-Age	Born≥1942 0	Low Medium High	12 25 26	130.61 136.39 132.63	0.464 (1.512)	0.759
		Born≥1942 >0-10	Low Medium High	17 37 29	127.21 129.11 126.78	-0.851 (1.568)	0.588
		Born≥1942 >10	Low Medium High	12 42 19	135.59 130.18 125.84	-3.972 (1.601)	0.014
	Initial-by-Lifetime Cigarette Smoking History	Born<1942 0	Low Medium High	20 30 11	130.39 129.72 133.74	1.512 (2.145)	0.481
		Born<1942 >0-10	Low Medium High	17 30 4	130.77 128.04 142.65	3.906 (2.580)	0.131
		Born<1942 >10	Low Medium High	32 58 22	132.72 131.95 137.55	1.488 (1.385)	0.283
Systolic Blood Pressure (Continuous) (Maximal-- 12-7 [d])	Initial-by-Lifetime Cigarette Smoking History	0	Low Medium High	58 85 48	129.91 130.50 134.92	1.457 (0.829)	0.079
		>0-10	Low Medium High	46 87 47	124.65 127.75 132.77	1.008 (0.928)	0.278
		>10	Low Medium High	68 146 58	133.10 132.10 131.13	-0.753 (0.737)	0.308

TABLE K-1. (Continued)
Summary of Dioxin-by-Covariate Interactions for
Cardiovascular Variables

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Adj. Mean/(n) <u>Current Dioxin</u>			Adj. Slope (Std. Error) ^b	p-Value
				Low	Medium	High		
Systolic Blood Pressure (Continuous) (Minimal-- 12-7 [g])	Current-by- Time-by-Family History of Heart Disease	Yes	≤18.6	125.03 (14)	129.51 (22)	133.76 (8)	4.018 (2.759)	0.072 ^c 0.146 ^d
			>18.6	131.79 (11)	138.52 (27)	130.18 (16)	-2.075 (1.942)	0.286 ^d
			No	134.06 (42)	128.57 (87)	130.65 (34)	-1.322 (1.208)	0.411 ^c 0.274 ^d
	Current-by- Time-by-Age	Born ≥1942	≤18.6	125.26 (46)	130.22 (79)	128.08 (51)	0.938 (0.888)	0.116 ^c 0.291 ^d
			>18.6	121.97 (11)	132.51 (50)	128.77 (55)	-1.194 (1.044)	0.253 ^d
			Born <1942	135.15 (56)	129.34 (86)	133.45 (16)	-1.825 (1.332)	0.030 ^c 0.171 ^d
			≤18.6	130.41 (57)	129.97 (104)	136.38 (32)	1.737 (0.973)	0.075 ^d

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Adj. Mean	Contrast	Difference of Adj. Means (95% C.I.)	p-Value
Systolic Blood Pressure (Continuous) (12-7 [j])	Categorized Current Dioxin-by- Age	Born ≥1942	Background	287	125.11	A11		0.278
			Unknown	106	125.70	U vs. B	0.60 (-3.12,4.31)	0.753
			Low	74	129.34	L vs. B	4.23 (0.00,8.47)	0.051
			High	101	125.98	H vs. B	0.87 (-2.91,4.66)	0.650
	Background	Born <1942	Background	375	130.76	A11		0.076
			Unknown	195	129.23	U vs. B	-1.53 (-4.41,1.36)	0.299
			Low	99	127.14	L vs. B	-3.62 (-7.30,0.06)	0.054
			High	48	133.98	H vs. B	3.22 (-1.77,8.22)	0.206

TABLE K-1. (Continued)
Summary of Dioxin-by-Covariate Interactions for
Cardiovascular Variables

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Percent Abnormal	Adj. Relative Risk (95% C.I.) ^a	p-Value
Systolic Blood Pressure (Discrete) (Minimal-- 12-8 [c])	Initial-by- Personality Type	Type A	Low	52	26.9	0.70 (0.48,1.00)	0.050
			Medium	95	17.9		
			High	44	11.4		
	Time-by- Personality Type	Type B	Low	55	20.0	1.11 (0.85,1.43)	0.447
			Medium	122	21.3		
			High	63	27.0		

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Percent Abnormal/(n)			Adj. Relative Risk (95% C.I.) ^a	p-Value
				Current	Dioxin	Low	Medium	High
Systolic Blood Pressure (Discrete) (Minimal-- 12-8 [g])	Current-by- Personality Type	Type A	≤18.6	32.3	20.5	5.6	0.41 (0.20,0.85)	0.076 ^e 0.017 ^f
				(31)	(44)	(18)		
			>18.6	10.0	19.6	14.8	0.86 (0.54,1.38)	0.542 ^f
	Time-by- Personality Type	Type B	≤18.6	12.0	12.3	37.5	1.57 (1.01,2.45)	0.024 ^e 0.047 ^f
			≤18.6	(25)	(65)	(24)		
			>18.6	35.7	25.8	22.2	0.83 (0.58,1.18)	0.298 ^f
Systolic Blood Pressure (Discrete) (Maximal-- 12-8 [h])	Current-by- Personality Type	Type A	≤18.6	16.3	25.0	7.7	0.71 (0.46,1.08)	0.228 ^e 0.106 ^f
				(49)	(76)	(26)		
			>18.6	9.4	19.7	15.8	0.97 (0.70,1.34)	0.851 ^f
	Time-by- Personality Type	Type B	≤18.6	15.2	10.7	29.7	1.33 (0.95,1.87)	0.078 ^e 0.094 ^f
			≤18.6	(46)	(84)	(37)		
			>18.6	23.5	27.5	25.0	0.91 (0.69,1.19)	0.486 ^f
			>18.6	(34)	(80)	(48)		

TABLE K-1. (Continued)
Summary of Dioxin-by-Covariate Interactions for
Cardiovascular Variables

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Percent Abnormal	Contrast	Adj. Relative Risk (95% C.I.)	p-Value
Systolic Blood Pressure (Discrete) (12-8 [j])	Categorized Current Dioxin-by-Age	Born ≥1942	Background	287	11.8	All		0.144
			Unknown	105	9.5	U vs. B	1.09 (0.50,2.39)	0.825
			Low	74	21.6	L vs. B	2.30 (1.15,4.59)	0.018
			High	100	17.0	H vs. B	1.29 (0.66,2.51)	0.452
	Categorized Current Dioxin-by-Differential Cortisol Response	Born <1942 ≤0.6	Background	136	25.7	All		0.947
			Unknown	64	25.0	U vs. B	1.02 (0.50,2.08)	0.949
			Low	31	29.0	L vs. B	1.14 (0.47,2.78)	0.776
			High	14	21.4	H vs. B	0.76 (0.20,2.92)	0.684
	Born <1942 >0.6-4.0		Background	125	27.2	All		0.016
			Unknown	62	8.1	U vs. B	0.29 (0.10,0.79)	0.016
			Low	40	15.0	L vs. B	0.40 (0.15,1.07)	0.068
			High	19	31.6	H vs. B	0.99 (0.34,2.90)	0.982
	Born <1942 >4.0		Background	113	26.6	All		0.007
			Unknown	69	27.5	U vs. B	1.21 (0.61,2.41)	0.590
			Low	27	3.7	L vs. B	0.08 (0.01,0.66)	0.019
			High	14	35.7	H vs. B	1.12 (0.33,3.79)	0.852

TABLE K-1. (Continued)
Summary of Dioxin-by-Covariate Interactions for
Cardiovascular Variables

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Percent Abnormal/(n)			Adj. Relative Risk (95% C.I.) ^a	p-Value
				Low	Medium	High		
Heart Sounds (Minimal-- 12-9 [g])	Current-by- Yes	Time-by- Family	≤18.6	14.3 (14)	0.0 (22)	0.0 (9)	--	--
			>18.6	0.0 (11)	12.0 (25)	6.3 (16)	2.66 (0.92,7.67)	0.070 ^f
		History of Heart Disease	≤18.6	6.7 (15)	0.0 (23)	9.1 (11)	0.63 (0.18,2.21)	0.467 ^f
			>18.6	37.5 (8)	0.0 (20)	0.0 (17)	--	--
	Current-by- No	Cigarette Smoking History	No	0.0 (13)	2.8 (36)	7.7 (13)	2.00 (0.51,7.78)	0.319 ^f
			>0-10	11.1 (9)	0.0 (21)	0.0 (13)	--	--
			No	5.9 (17)	0.0 (31)	0.0 (12)	--	--
		>10	≤18.6	4.8 (21)	4.4 (46)	5.9 (17)	1.29 (0.59,2.83)	0.520 ^f
			>18.6	--	--	--	--	--

TABLE K-1. (Continued)

**Summary of Dioxin-by-Covariate Interactions for
Cardiovascular Variables**

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Percent Abnormal/(n) <u>Current Dioxin</u>			Adj. Relative Risk (95% C.I.) ^a	p-Value
				Low	Medium	High		
Heart Sounds (Maximal-- 12-9 [h])	Current-by- Yes Time-by- Family History of Heart Disease	≤ 18.6	18.6	17.4 (23)	5.4 (37)	0.0 (11)	0.21 (0.04,1.06)	0.002 ^e 0.059 ^f
			>18.6	5.3 (19)	2.9 (35)	12.5 (24)	1.90 (0.96,3.76)	0.065 ^f
		No	≤ 18.6	3.3 (30)	2.5 (40)	7.1 (14)	1.08 (0.44,2.63)	0.378 ^e 0.868 ^f
	Current-by- No Time-by- 0 Lifetime Cigarette Smoking History	>18.6	≤ 18.6	0.0 (14)	11.1 (27)	0.0 (23)	0.56 (0.16,1.98)	0.365 ^f
			>18.6	0.0 (8)	3.9 (26)	0.0 (17)	--	--
		No	≤ 18.6	0.0 (23)	2.4 (42)	4.4 (23)	3.11 (0.91,10.67)	0.071 ^f
		>10	≤ 18.6	0.0 (8)	3.9 (26)	0.0 (17)	--	--
		No	≤ 18.6	3.7 (27)	2.1 (48)	0.0 (20)	0.40 (0.06,2.80)	0.126 ^e 0.353 ^f
		>10	>18.6	0.0 (27)	4.6 (66)	4.4 (23)	1.61 (0.85,3.04)	0.147 ^f
	ECG: Nonspecific ST- and T-Wave Changes (Maximal-- 12-13 [h])	Current-by- Born ≥ 1942 Time-by-Age	≤ 18.6	8.7 (46)	4.9 (81)	2.0 (51)	0.72 (0.40,1.30)	0.704 ^e 0.276 ^f
			>18.6	9.1 (11)	12.0 (50)	9.1 (55)	0.83 (0.52,1.33)	0.436 ^f
			Born<1942	≤ 18.6	8.8 (57)	11.6 (86)	29.4 (17)	1.40 (0.88,2.25)
		>18.6	≤ 18.6	10.5 (57)	16.4 (104)	21.9 (32)	1.12 (0.81,1.56)	0.498 ^f

TABLE K-1. (Continued)
Summary of Dioxin-by-Covariate Interactions for
Cardiovascular Variables

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Percent Abnormal	Contrast	Adj. Relative Risk (95% C.I.)	p-Value
ECG: Bradycardia (12-14 [j])	Categorized Current Dioxin-by- Race	Black	Background	42	0.0	All		0.005
			Unknown	11	18.2	U vs. B	--	0.080
			Low	9	10.0	L vs. B	--	0.352
			High	6	0.0	H vs. B	--	--
	Non-Black	Background						
			Unknown	292	5.5	U vs. B	0.86 (0.47,1.59)	0.636
			Low	165	3.0	L vs. B	0.47 (0.18,1.22)	0.121
			High	144	2.8	H vs. B	0.44 (0.15,1.27)	0.128

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Percent Abnormal	Adj. Relative Risk (95% C.I.) ^a	p-Value
ECG: Arrhythmia (Minimal-- 12-15 [c])	Initial-by- Personality Type	Type A	Low	52	1.9	2.54 (1.32,4.89)	0.005
			Medium	95	1.1		
			High	44	9.1		
	Type B	Type B	Low	55	1.8	1.06 (0.62,1.81)	0.837
			Medium	123	7.3		
			High	64	1.6		

TABLE K-1. (Continued)
Summary of Dioxin-by-Covariate Interactions for
Cardiovascular Variables

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Percent Abnormal/(n) <u>Current Dioxin</u>			Adj. Relative Risk (95% C.I.) ^a	p-Value
				Low	Medium	High		
ECG: Arrhythmia (Maximal-- 12-15 [h])	Current-by- Time-by- Differential	≤ 0.6	≤ 18.6	0.0 (26)	5.7 (53)	10.0 (20)	1.97 (0.91,4.28)	0.314 ^e 0.086 ^f
			>18.6	0.0 (21)	1.9 (54)	2.9 (34)	1.08 (0.39,2.99)	0.888 ^f
			$>0.6-4.0$	≤ 18.6 (34)	0.0 (62)	3.9 (26)	--	--
	Cortisol Response	>4.0	>18.6	12.0 (25)	5.8 (52)	0.0 (33)	0.36 (0.12,1.12)	0.077 ^f
			≤ 18.6	5.6 (36)	0.0 (45)	11.8 (17)	1.41 (0.61,3.29)	0.848 ^e 0.421 ^f
			>18.6	21.1 (19)	4.6 (44)	12.5 (16)	1.57 (0.81,3.05)	0.185 ^f

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Adj.	Adj. Slope (Std. Error) ^g	p-Value
					Mean		
Diastolic Blood Pressure (Continuous) (Maximal-- 12-17 [d])	Initial-by- Personality Type	Type A	Low	87	77.99	-0.757 (0.401)	0.060
			Medium	141	77.21		
			High	64	75.85		
	Initial-by- Personality Type	Type B	Low	76	75.97	0.882 (0.362)	0.015
			Medium	169	77.96		
			High	84	79.30		

TABLE K-1. (Continued)
Summary of Dioxin-by-Covariate Interactions for
Cardiovascular Variables

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Adj. Mean	Contrast	Difference of Adj. Means (95% C.I.)	p-Value
Diastolic Blood Pressure (Continuous) (12-17 [j])	Categorized Current Dioxin-by- Personality Type	Type A Yes	Background	52	74.70	A11		0.591
			Unknown	34	74.10	U vs. B	-0.60 (-4.50,3.29)	0.762
			Low	14	77.79	L vs. B	3.09 (-2.24,8.42)	0.256
			High	12	73.76	H vs. B	-0.94 (-6.61,4.73)	0.745
	Categorized Current Dioxin-by- Family History of Heart Disease	Type A No	Background	223	74.87	A11		0.440
			Unknown	112	76.07	U vs. B	1.20 (-0.85,3.26)	0.252
			Low	59	75.27	L vs. B	0.40 (-2.18,2.99)	0.759
			High	50	73.63	H vs. B	-1.23 (-4.02,1.55)	0.385
	Type B Yes	Type B Yes	Background	85	74.10	A11		<0.001
			Unknown	40	71.73	U vs. B	-2.37 (-5.76,1.02)	0.171
			Low	24	81.02	L vs. B	6.92 (2.84,11.00)	<0.001
			High	19	78.39	H vs. B	4.29 (-0.19,8.77)	0.061
	Type B No	Type B No	Background	299	74.22	A11		0.065
			Unknown	111	73.58	U vs. B	-0.64 (-2.61,1.33)	0.523
			Low	73	74.94	L vs. B	0.72 (-1.58,3.02)	0.541
			High	62	77.28	H vs. B	3.06 (0.57,5.56)	0.016

TABLE K-1. (Continued)
Summary of Dioxin-by-Covariate Interactions for
Cardiovascular Variables

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Percent Abnormal	Contrast	Adj. Relative Risk (95% C.I.)	p-Value
Funduscopic Examination (12-19 [f])	Categorized Current Dioxin-by- Differential Cortisol Response	≤ 0.6	Background	236	1.7	All		0.476
			Unknown	93	1.1	U vs. B	0.55 (0.06,5.07)	0.600
			Low	61	0.0	L vs. B	--	--
			High	55	0.0	H vs. B	--	--
		$>0.6-4.0$	Background	228	0.0	All		--
			Unknown	102	0.0	U vs. B	--	--
			Low	63	1.6	L vs. B	--	0.432
		>4.0	Background	203	0.0	All		--
			Unknown	108	1.9	U vs. B	--	0.240
			Low	50	0.0	L vs. B	--	--
			High	34	0.0	H vs. B	--	--

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Percent Abnormal	Adj. Relative Risk (95% C.I.) ^a	p-Value
Femoral Pulses (Minimal-- 12-22 [c])	Initial-by- Personality Type	Type A	Low	51	0.0	3.28 (1.03,10.44)	0.045
			Medium	95	0.0		
			High	41	4.9		
		Type B	Low	55	0.0	0.65 (0.28,1.51)	0.319
			Medium	121	6.6		
			High	62	0.0		
	Initial-by- Personality Type	Type A	Low	87	0.0	3.09 (1.06,8.96)	0.038
			Medium	139	0.0		
			High	62	3.2		
		Type B	Low	75	2.7	0.86 (0.49,1.52)	0.604
			Medium	169	5.3		
			High	83	0.0		

TABLE K-1. (Continued)
Summary of Dioxin-by-Covariate Interactions for
Cardiovascular Variables

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Percent Abnormal/(n)			Adj. Relative Risk (95% C.I.)	p-Value
				Low	Medium	High		
Femoral Pulses (Maximal-- 12-22 [h])	Current-by- Time-by- Percent Body	Normal ≤ 0.6	≤ 18.6	0.0 (27)	4.7 (43)	6.7 (15)	1.79 (0.63,5.13)	0.307 ^e 0.266 ^f
			>18.6	6.3 (16)	0.0 (41)	4.2 (24)		
		Fat $>0.6-4.0$	≤ 18.6	0.0 (29)	0.0 (48)	0.0 (16)	0.01 (0.00,4.74)	0.216 ^f
			>18.6	0.0 (24)	2.3 (43)	0.0 (26)		
	Differential Cortisol Response	Normal >4.0	≤ 18.6	3.1 (32)	0.0 (35)	0.0 (15)	--	--
			>18.6	6.3 (16)	2.8 (36)	0.0 (10)		
		Obese ≤ 0.6	≤ 18.6	0.0 (0)	0.0 (9)	0.0 (5)	0.97 (0.22,4.31)	0.965 ^f
			>18.6	0.0 (5)	14.3 (14)	0.0 (10)		
	Obese $>0.6-4.0$	Obese ≤ 18.6	≤ 18.6	0.0 (3)	0.0 (14)	0.0 (9)	--	--
			>18.6	0.0 (2)	12.5 (8)	0.0 (8)		
		Obese >4.0	≤ 18.6	0.0 (3)	0.0 (10)	0.0 (3)	--	--
			>18.6	0.0 (3)	0.0 (7)	25.0 (4)		

TABLE K-1. (Continued)
Summary of Dioxin-by-Covariate Interactions for
Cardiovascular Variables

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Percent Abnormal	Contrast	Adj. Relative Risk (95% C.I.)	p-Value
Femoral Pulses (12-22 [j])	Categorized Current Dioxin-by- Personality Type	Type A	Background	277	0.0	All	--	--
			Unknown	147	0.0	U vs. B	--	--
			Low	74	0.0	L vs. B	--	--
			High	62	3.2	H vs. B	--	0.066
		Type B	Background	383	1.3	All		0.296
			Unknown	153	3.3	U vs. B	2.53 (0.71,8.97)	0.151
			Low	98	4.1	L vs. B	3.47 (0.90,13.39)	0.071
			High	86	1.2	H vs. B	1.44 (0.16,12.93)	0.745

TABLE K-1. (Continued)
Summary of Dioxin-by-Covariate Interactions for
Cardiovascular Variables

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Percent Abnormal/(n)			Adj. Relative Risk (95% C.I.) ^a	p-Value
				Low	Medium	High		
Popliteal Pulses (Minimal 12-23 [g])	Current-by- Time-by- Family History of Heart Disease	Yes	≤18.6	7.1 (14)	0.0 (22)	0.0 (9)	--	--
			>18.6	0.0 (11)	3.7 (27)	0.0 (15)	--	--
			No	2.4 (41)	4.6 (88)	0.0 (34)	0.71 (0.21,2.45)	0.791 ^e 0.589 ^f
	Current-by- Time-by- Lifetime Cigarette Smoking History	0	≤18.6	2.9 (35)	0.0 (50)	0.0 (15)	--	--
			>18.6	0.0 (20)	0.0 (34)	0.0 (32)	--	--
			>0-10	0.0 (30)	7.7 (52)	0.0 (27)	0.86 (0.31,2.40)	0.625 ^e 0.778 ^f
Popliteal Pulses (Maximal-- 12-23 [h])	>10	>10	≤18.6	0.0 (11)	5.9 (34)	5.6 (18)	1.20 (0.47,3.04)	0.708 ^f
			>18.6	0.0 (30)	1.7 (58)	4.6 (22)	2.50 (0.57,10.95)	0.120 ^e 0.225 ^f
			>18.6	5.7 (35)	6.2 (81)	3.1 (32)	0.69 (0.35,1.36)	0.279 ^f

TABLE K-1. (Continued)
Summary of Dioxin-by-Covariate Interactions for
Cardiovascular Variables

Ranch Hands - Log₂ (Initial Dioxin)							
Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Percent Abnormal	Adj. Relative Risk (95% C.I.) ^a	p-Value
Dorsalis Pedis Pulses (Minimal-- 12-24 [c])	Initial-by- Differential Cortisol Response	≤0.6	Low Medium High	35 79 40	17.1 20.3 15.0	0.90 (0.61,1.32)	0.578
		>0.6-4.0	Low Medium High	42 80 45	4.8 11.3 20.0	1.42 (0.99,2.05)	0.056
		>4.0	Low Medium High	29 60 20	6.9 8.3 10.0	1.55 (0.79,3.05)	0.207
	Initial-by- Age	Born ≥1942	Low Medium High	38 103 69	18.4 10.7 13.0	0.86 (0.60,1.22)	0.396
		Born <1942	Low Medium High	68 116 36	8.8 25.0 27.8	1.41 (1.03,1.93)	0.030
Ranch Hands - Log₂ (Current Dioxin) and Time							
Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Percent Abnormal/(n) <u>Current Dioxin</u>			
				Low	Medium	High	Adj. Relative Risk (95% C.I.) ^a
Leg Pulses (Minimal-- 12-26 [g])	Current-by- Time-by- Lifetime Cigarette Smoking History	0	>18.6	22.2 (18)	10.0 (30)	8.3 (12)	0.51 (0.19,1.36)
				0.0 (11)	11.1 (27)	12.5 (24)	1.14 (0.55,2.36)
				20.0 (15)	14.0 (43)	23.5 (17)	1.65 (0.85,3.23)
		>0-10	>18.6	18.2 (11)	25.0 (28)	28.6 (14)	1.35 (0.73,2.48)
				0.0 (22)	18.4 (38)	14.3 (14)	0.634 ^e
			≤18.6	23.1 (26)	24.1 (58)	13.6 (22)	0.140 ^f
				0.0 (22)	18.4 (38)	14.3 (14)	0.003 ^e
		>10	>18.6	23.1 (26)	24.1 (58)	13.6 (22)	2.73 (1.29,5.75)
				0.0 (22)	18.4 (38)	14.3 (14)	0.008 ^f
			≤18.6	23.1 (26)	24.1 (58)	13.6 (22)	0.75 (0.47,1.20)
							0.231 ^f

TABLE K-1. (Continued)
Summary of Dioxin-by-Covariate Interactions for
Cardiovascular Variables

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Percent Abnormal	Adj. Relative Risk (95% C.I.) ^a	p-Value
Peripheral and All Pulses (Minimal-- 12-27 [c])	Initial-by- Age	Born≥1942	Low	38	21.1	0.83 (0.59,1.18)	0.306
			Medium	103	10.7		
			High	69	13.0		
	Born<1942	Low	68		8.8	1.41 (1.04,1.93)	0.029
			Medium	116	25.0		
			High	36	27.8		

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Percent Abnormal/(n)			Adj. Relative Risk (95% C.I.) ^a	p-Value
				Current	Dioxin	Low	Medium	High
Peripheral and All Pulses (Minimal-- 12-27 [g])	Current-by- Time-by- Lifetime	0	≤18.6	22.2	10.0	8.3	0.51 (0.19,1.38)	0.295 ^e
			(18)	(30)	(12)		0.185 ^f	
			>18.6	9.1	11.1	12.5	0.94 (0.46,1.90)	
			(11)	(27)	(24)		0.856 ^f	
			>0-10					
			≤18.6	20.0	14.0	23.5	1.68 (0.88,3.23)	0.807 ^e
			(15)	(43)	(17)		0.118 ^f	
			>18.6	18.2	25.0	28.6	1.52 (0.84,2.76)	
			(11)	(28)	(14)		0.170 ^f	
	Cigarette Smoking History	>10	≤18.6	0.0	18.4	14.3	2.71 (1.29,5.70)	
			(22)	(38)	(14)		0.003 ^e	0.008 ^f
			>18.6	23.1	24.1	13.6	0.75 (0.47,1.20)	
			(26)	(58)	(22)		0.237 ^f	

TABLE K-1. (Continued)

**Summary of Dioxin-by-Covariate Interactions for
Cardiovascular Variables**

^aRelative risk for a twofold increase in dioxin.

^bAdjusted slope and standard error based on systolic blood pressure versus log₂ dioxin.

^cTest of significance for homogeneity of slopes (current dioxin continuous, time categorized).

^dTest of significance for slope equal to 0 (current dioxin continuous, time categorized).

^eTest of significance for homogeneity of relative risks (current dioxin continuous, time categorized).

^fTest of significance for relative risk equal to 1 (current dioxin continuous, time categorized).

^gAdjusted slope and standard error based on diastolic blood pressure versus log₂ dioxin.

--: Relative risk/confidence interval/p-value not given due to the sparse number of abnormalities.

Note: Initial Dioxin: Minimal--Low: 52-93 ppt; Medium: >93-292 ppt; High: >292 ppt.

Maximal--Low: 25-56.9 ppt; Medium: >56.9-218 ppt; High: >218 ppt.

Current Dioxin: Minimal--Low: >10-14.65 ppt; Medium: >14.65-45.75 ppt; High: >45.75 ppt.

Maximal--Low: >5-9.01 ppt; Medium: >9.01-33.3 ppt; High: >33.3 ppt.

All: All categories.

Background (B) (Comparisons): Current Dioxin \leq 10 ppt.

Unknown (U) (Ranch Hands): Current Dioxin \leq 10 ppt.

Low (L) (Ranch Hands): 15 ppt < Current Dioxin \leq 33.3 ppt.

High (H) (Ranch Hands): Current Dioxin >33.3 ppt.

TABLE K-2.
Summary of Models Without Adjustment for Percent Body Fat and Cholesterol for Cardiovascular Variables
Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Table Ref.)	Assumption	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Reported/ Verified Essential Hypertension (12-3 [c])	Minimal (n=440)	1.09 (0.92,1.29)	0.295	DRKYR (p=0.080) HRTDIS (p=0.007)
Reported/ Verified Essential Hypertension (12-3 [d])	Maximal (n=617)	1.10 (0.97,1.25)	0.124	RACE (p=0.385) PACKYR (p=0.252) DRKYR (p=0.049) DIFCORT (p=0.326) HRTDIS (p<0.001)

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Table Ref.)	Assumption	Time (Yrs.)	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Reported/ Verified Essential Hypertension (12-3 [g])	Minimal (n=428)	≤18.6	1.25 (0.95,1.65)	0.217 ^b	DRKYR (p=0.051)
		>18.6	1.00 (0.79,1.26)	0.108 ^c	DIFCORT (p=0.106)
Reported/ Verified Essential Hypertension (12-3 [h])	Maximal (n=638)	≤18.6	1.25 (1.03,1.52)	0.336 ^b	AGE (p=0.025)
		>18.6	1.10 (0.93,1.32)	0.023 ^c	RACE (p=0.265)
				0.271 ^c	PACKYR (p=0.326)
					DRKYR (p=0.068)
					HRTDIS (p<0.001)

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Current Dioxin Category	n	Contrast	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
Reported/ Verified Essential Hypertension (12-3 [j])	Background	701	All Categories		0.002	AGE (p<0.007)
	Unknown	317	Unknown vs. Background	0.78 (0.58,1.04)	0.094	DRKYR (p=0.047)
	Low	175	Low vs. Background	1.27 (0.90,1.81)	0.178	HRTDIS (p=0.056)
	High	151	High vs. Background	1.70 (1.17,2.49)	0.006	
Total		1,344				

TABLE K-2. (Continued)
Summary of Models Without Adjustment for Percent Body Fat and
Cholesterol for Cardiovascular Variables

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Table Ref.)	Assumption	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Reported/Verified Myocardial Infarction (12-6 [d])	Maximal (n=638)	1.26 (0.95,1.68)	0.121	AGE (p<0.001) DRKYR (p=0.026)

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Table Ref.)	Assumption	Time (Yrs.)	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Reported/Verified Myocardial Infarction (12-6 [h])	Maximal (n=638)	≤18.6	1.62 (0.99,2.66)	0.182 ^b	AGE (p<0.001)
		>18.6	1.06 (0.72,1.56)	0.055 ^c 0.752 ^c	DRKYR (p=0.022)

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Table Ref.)	Assumption	Initial Dioxin	n	Adj. Mean	Adj. Slope (Std. Error) ^d	p-Value	Covariate Remarks
Systolic Blood Pressure (Continuous) (12-7 [c])	Minimal (n=446)	Low Medium High	110 224 112	129.98** 129.53** 131.55**	0.614 (0.702)**	0.382**	INIT*AGE (p=0.033) INIT*PACKYR (p=0.031) RACE (p=0.175)
Systolic Blood Pressure (Continuous) (12-7 [d])	Maximal (n=647)	Low Medium High	173 320 154	128.31** 129.73** 133.12**	0.964 (0.489)**	0.049**	INIT*PACKYR (p=0.013) AGE (p<0.001) RACE (p=0.042)

TABLE K-2. (Continued)

Summary of Models Without Adjustment for Percent Body Fat and Cholesterol for Cardiovascular Variables

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Table Ref.)	Time Assumption(Yrs.)	Adj. Mean(n) <u>Current Dioxin</u>			Adj. Slope (Std. Error) ^d	p-Value	Covariate Remarks
		Low	Medium	High			
Systolic Blood Pressure (Continuous) (12-7 [g])	Minimal (n=433)	≤18.6 (56)	131.22 (110)	128.68 (43)	131.93	-0.117 (1.126)	0.929 ^e RACE (p=0.158) PERS (p=0.197) HRTDIS (p=0.224)
Systolic Blood Pressure (Continuous) (12-7 [h])	Maximal (n=647)	>18.6 (48)	131.11 (113)	132.10 (63)	130.46	0.013 (0.920)	0.989 ^f AGE (p=0.002) RACE (p=0.018) PACKYR (p=0.063)

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Current Dioxin Category	n	Adj. Mean	Contrast	Difference of Adj. Means (95% C.I.)	p-Value	Covariate Remarks
Systolic Blood Pressure (Continuous) (12-7 [j])	Background	667	128.95**	All Categories		0.012**	DXCAT*AGE (p=0.022)
	Unknown	303	126.89**	Unknown vs. Background	-2.06 (-4.37,0.26)**	0.082**	RACE (p=0.074)
	Low	174	129.25**	Low vs. Background	0.30 (-2.53,3.13)**	0.837**	DIFCORT (p=0.005)
	High	150	132.61**	High vs. Background	3.67 (0.60,6.73)**	0.019**	HRTDIS (p=0.067)
	Total	1,294					

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Table Ref.)	Assumption	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Systolic Blood Pressure (Discrete) (12-8 [c])	Minimal (n=433)	0.97 (0.79,1.19)**	0.764**	INIT*PERS (p=0.043) RACE (p=0.119)
Systolic Blood Pressure (Discrete) (12-8 [d])	Maximal (n=647)	1.12 (0.97,1.31)	0.127	AGE (p=0.011) RACE (p=0.012)

TABLE K-2. (Continued)
Summary of Models Without Adjustment for Percent Body Fat and
Cholesterol for Cardiovascular Variables

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Table Ref.)	Assumption	Time (Yrs.)	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Systolic Blood Pressure (Discrete) (12-8 [g])	Minimal (n=433)	≤18.6 >18.6	**** ****	**** ****	CURR*TIME*PERS (p=0.002) RACE (p=0.128)
Systolic Blood Pressure (Discrete) (12-8 [h])	Maximal (n=624)	≤18.6 >18.6	1.08 (0.85,1.37)** 0.99 (0.81,1.21)**	0.552** ^b 0.508** ^c 0.887** ^c	CURR*TIME*PERS (p=0.040) RACE (p=0.025) HRTDIS (p=0.060)

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Current Dioxin Category	n	Contrast	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
Systolic Blood Pressure (Discrete) (12-8 [j])	Background	666	All Categories		****	DXCAT*AGE (p=0.002) RACE (p=0.084)
	Unknown	301	Unknown vs. Background	****	****	PACKYR (p=0.064)
	Low	173	Low vs. Background	****	****	PERS (p=0.102)
	High	148	High vs. Background	****	****	DIFCORT (p=0.134) HRTDIS (p=0.056)
	Total	1,288				

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Table Ref.)	Assumption	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Overall Electrocardiograph (12-10 [c])	Minimal (n=446)	1.07 (0.85,1.35)	0.583	AGE (p<0.001) RACE (p=0.134)

TABLE K-2. (Continued)
Summary of Models Without Adjustment for Percent Body Fat and Cholesterol for Cardiovascular Variables
Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Current Dioxin Category	n	Contrast	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
ECG: Right Bundle Branch Block (12-11 [f])	Background	703	All Categories		0.634	AGE (p=0.002) RACE (p=0.028)
	Unknown	320	Unknown vs. Background	1.07 (0.20,5.75)	0.935	
	Low	177	Low vs. Background	1.92 (0.36,10.24)	0.447	
	High	155	High vs. Background	--	0.552	
	Total	1,355				

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Table Ref.)	Assumption	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
ECG: Nonspecific ST- and T-Wave Changes (12-13 [c])	Minimal (n=446)	1.02 (0.78,1.34)	0.874	AGE (p<0.001) RACE (p=0.021) PACKYR (p=0.033)
ECG: Nonspecific ST- and T-Wave Changes (12-13 [d])	Maximal (n=647)	1.12 (0.92,1.36)	0.265	AGE (p<0.001) RACE (p=0.031) PACKYR (p=0.012)

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Table Ref.)	Assumption	Time (Yrs.)	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
ECG: Nonspecific ST- and T-Wave Changes (12-13 [g])	Minimal (n=446)	≤18.6	1.19 (0.73,1.94)	0.396 ^b	AGE (p<0.001)
		>18.6	0.92 (0.66,1.30)	0.478 ^c 0.654 ^c	RACE (p=0.024) PACKYR (p=0.039)
ECG: Nonspecific ST- and T-Wave Changes (12-13 [h])	Maximal (n=647)	≤18.6	1.17 (0.84,1.63)**	0.703** ^b 0.356** ^c	CURR*TIME*AGE (p=0.015)
		>18.6	1.08 (0.84,1.39)**	0.545** ^c	RACE (p=0.046) PACKYR (p=0.016)

TABLE K-2. (Continued)
Summary of Models Without Adjustment for Percent Body Fat and Cholesterol for Cardiovascular Variables
Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Current Dioxin Category	n	Contrast	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
ECG: Nonspecific ST- and T-Wave Changes (12-13 [j])	Background	703	All Categories		0.142	AGE (p<0.001) RACE (p=0.047) PACKYR (p=0.020)
	Unknown	320	Unknown vs. Background	0.69 (0.43,1.11)	0.130	
	Low	177	Low vs. Background	1.22 (0.73,2.04)	0.458	
	High	155	High vs. Background	1.46 (0.83,2.56)	0.194	
	Total	1,355				
ECG: Bradycardia (12-14 [j])	Background	667	All Categories		0.142**	DXCAT*RACE (p=0.025)
	Unknown	303	Unknown vs. Background	1.08 (0.61,1.94)**	0.785**	PACKYR (p=0.007)
	Low	174	Low vs. Background	0.56 (0.23,1.36)**	0.203**	DIFCORT (p=0.024)
	High	150	High vs. Background	0.41 (0.14,1.17)**	0.095**	HRTDIS (p=0.040)
	Total	1,294				
ECG: Other Diagnoses (12-16 [j])	Background	669	All Categories		0.105	AGE (p<0.001) PERS (p=0.092)
	Unknown	303	Unknown vs. Background	0.94 (0.66,1.33)	0.722	
	Low	173	Low vs. Background	1.04 (0.68,1.59)	0.867	
	High	150	High vs. Background	0.51 (0.28,0.91)	0.024	
	Total	1,295				

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Table Ref.)	Assumption	Initial Dioxin	n	Adj. Mean	Adj. Slope (Std. Error) ^g	p-Value	Covariate Remarks
Diastolic Blood Pressure (Continuous) (12-17 [c])	Minimal (n=433)	Low Medium High	107 218 108	77.41 79.19 78.02	0.228 (0.373)	0.542	RACE (p=0.031) PERS (p=0.059) HRTDIS (p=0.014)
Diastolic Blood Pressure (Continuous) (12-17 [d])	Maximal (n=624)	Low Medium High	164 311 149	**** **** ****	****	****	INIT*PERS (p=0.005) RACE (p=0.019)

TABLE K-2. (Continued)
Summary of Models Without Adjustment for Percent Body Fat and Cholesterol for Cardiovascular Variables
Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Table Ref.)	Time Assumption(Yrs.)	Adj. Mean(n) <u>Current Dioxin</u>			Adj. Slope (Std. Error) ^g	p-Value	Covariate Remarks	
		Low	Medium	High				
Diastolic Blood Pressure (Continuous) (12-17 [gl])	Minimal (n=433)	≤18.6	76.58 (56)	78.69 (110)	77.29 (43)	0.349 (0.606)	0.735 ^e 0.565 ^f	RACE (p=0.034) PERS (p=0.064) HRTDIS (p=0.015)
Diastolic Blood Pressure (Continuous) (12-17 [gl])	Maximal (n=647)	>18.6	77.96 (48)	79.67 (113)	78.14 (63)	0.084 (0.495)	0.865 ^f	0.728 ^e 0.614 ^f
Diastolic Blood Pressure (Continuous) (12-17 [h])	Maximal (n=647)	≤18.6	76.48 (103)	77.00 (167)	76.58 (68)	0.202 (0.401)	0.392 (0.372)	RACE (p=0.029) 0.292 ^f

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Current Dioxin Category	n	Adj. Mean	Difference of Adj. Means (95% C.I.)		p-Value	Covariate Remarks
				Contrast			
Diastolic Blood Pressure (Continuous) (12-17 [j])	Background	664	74.64**	All Categories		0.002**	DXCAT*PERS (p=0.012)
	Unknown	298	73.81**	Unknown vs. Background	-0.83 (-2.10,0.44)**	0.199**	DXCAT*HRTDIS
	Low	171	76.49**	Low vs. Background	1.85 (0.29,3.40)**	0.020**	(p=0.011)
	High	144	76.71**	High vs. Background	2.06 (0.37,3.76)**	0.017**	AGE (p=0.008) DRKYR (p=0.017)
Total		1,277					DIFCORT (p=0.011)

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Table Ref.)	Assumption	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Diastolic Blood Pressure (Discrete) (12-18 [c])	Minimal (n=446)	0.88 (0.60,1.28)	0.500	AGE (p=0.116) HRTDIS (p=0.062)

TABLE K-2. (Continued)

Summary of Models Without Adjustment for Percent Body Fat and Cholesterol for Cardiovascular Variables

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Table Ref.)	Assumption	Time (Yrs.)	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Diastolic Blood Pressure (Discrete) (12-18 [g])	Minimal (n=446)	≤18.6	0.83 (0.43,1.60)	0.977 ^b	AGE (p=0.074)
		>18.6	0.84 (0.52,1.37)	0.585 ^c	HRTDIS (p=0.066)
				0.490 ^c	

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Current Dioxin Category	n	Contrast	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
Diastolic Blood Pressure (Discrete) (12-18 [j])	Background	703	All Categories		0.285	PACKYR (p=0.077)
	Unknown	320	Unknown vs. Background	0.71 (0.34,1.48)	0.364	
	Low	177	Low vs. Background	1.62 (0.81,3.24)	0.170	
	High	155	High vs. Background	1.26 (0.56,2.80)	0.577	
	Total	1,355				

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Table Ref.)	Assumption	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Femoral Pulses (12-22 [c])	Minimal (n=427)	0.99 (0.54,1.82)**	0.970**	INIT*PERS (p=0.029) AGE (p=0.011) DIFCORT (p=0.043) HRTDIS (p=0.070)
Femoral Pulses (12-22 [d])	Maximal (n=618)	1.09 (0.69,1.72)**	0.709**	INIT*PERS (p=0.040) AGE (p=0.008) PACKYR (p=0.097) HRTDIS (p=0.048)

TABLE K-2. (Continued)

Summary of Models Without Adjustment for Percent Body Fat and Cholesterol for Cardiovascular Variables

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Table Ref.)	Assumption	Time (Yrs.)	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Femoral Pulses (12-22 [g])	Minimal (n=427)	≤18.6 >18.6	1.30 (0.38,4.42) 0.69 (0.29,1.63)	0.421 ^b 0.678 ^c 0.400 ^c	AGE (p=0.039) PERS (p=0.148) DIFCORT (p=0.058) HRTDIS (p=0.080)
Femoral Pulses (12-22 [h])	Maximal (n=616)	≤18.6 >18.6	1.22 (0.49,3.02) 0.93 (0.53,1.66)	0.633 ^b 0.675 ^c 0.818 ^c	AGE (p=0.018) PACKYR (p=0.114) PERS (p=0.046) DIFCORT (p=0.333) HRTDIS (p=0.052)

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Current Dioxin Category	n	Contrast	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
Dorsalis Pedis Pulses (12-24 [j])	Background	658	All Categories		0.087	AGE (p=0.001) PERS (p=0.145)
	Unknown	297	Unknown vs. Background	1.17 (0.74,1.86)	0.498	DIFCORT (p=0.141)
	Low	172	Low vs. Background	1.65 (0.99,2.75)	0.056	
	High	146	High vs. Background	1.86 (1.07,3.26)	0.029	
	Total	1,273				

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Table Ref.)	Assumption	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Posterior Tibial Pulses (12-25 [c])	Minimal (n=430)	1.04 (0.65,1.66)	0.886	AGE (p<0.001) DIFCORT (p<0.001)
Posterior Tibial Pulses (12-25 [d])	Maximal (n=603)	1.34 (0.93,1.91)	0.124	AGE (p<0.001) PERS (p=0.102) DIFCORT (p<0.001)

TABLE K-2. (Continued)
Summary of Models Without Adjustment for Percent Body Fat and Cholesterol for Cardiovascular Variables
Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Table Ref.)	Assumption	Time (Yrs.)	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Posterior Tibial Pulses (12-25 [g])	Minimal (n=430)	≤18.6 >18.6	0.98 (0.35,2.72) 0.89 (0.48,1.63)	0.866 ^b 0.971 ^c 0.698 ^c	AGE (p<0.001) DIFCORT (p<0.001)
Posterior Tibial Pulses (12-25 [h])	Maximal (n=619)	≤18.6 >18.6	1.65 (0.84,3.26) 1.18 (0.76,1.85)	0.414 ^b 0.146 ^c 0.465 ^c	AGE (p<0.001) DIFCORT (p<0.001)

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Current Dioxin Category	n	Contrast	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
Posterior Tibial Pulses (12-25 [j])	Background	694	All Categories		<0.001	AGE (p<0.001)
	Unknown	316	Unknown vs. Background	0.43 (0.12,1.50)	0.185	
	Low	176	Low vs. Background	4.21 (1.92,9.22)	<0.001	
	High	153	High vs. Background	1.01 (0.22,4.61)	0.987	
	Total	1,339				

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Table Ref.)	Assumption	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Leg Pulses (12-26 [c])	Minimal (n=430)	1.15 (0.92,1.44)**	0.235**	INIT*AGE (p=0.029) DIFCORT (p=0.028)

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Table Ref.)	Assumption	Time (Yrs.)	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Leg Pulses (12-26 [g])	Minimal (n=430)	≤18.6 >18.6	1.35 (0.92,1.97) 0.99 (0.73,1.33)	0.201** ^b 0.126** ^c 0.943** ^c	CURR*TIME*PACKYR (p=0.035) AGE (p=0.003) DIFCORT (p=0.017)

TABLE K-2. (Continued)
Summary of Models Without Adjustment for Percent Body Fat and Cholesterol for Cardiovascular Variables
Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Current Dioxin Category	n	Contrast	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
Leg Pulses (12-26 [jj])	Background	660	All Categories		0.011	AGE (p<0.001) PERS (p=0.118)
	Unknown	299	Unknown vs. Background	1.06 (0.69,1.62)	0.799	
	Low	172	Low vs. Background	1.95 (1.24,3.08)	0.004	
	High	148	High vs. Background	1.84 (1.09,3.10)	0.023	
	Total	1,279				

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Table Ref.)	Assumption	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Peripheral and All Pulses (12-27 [c])	Minimal (n=430)	1.13 (0.90,1.42)**	0.297**	INIT*AGE (p=0.021) DIFCORT (p=0.027)

^aRelative risk for a twofold increase in dioxin.

^bTest of significance for homogeneity of relative risks (current dioxin continuous, time categorized).

^cTest of significance for relative risk equal to 1 (current dioxin continuous, time categorized).

^dSlope and standard error based on systolic blood pressure versus log₂ dioxin.

^eTest of significance for homogeneity of slopes (current dioxin continuous, time categorized).

^fTest of significance for slope equal to 0 (current dioxin continuous, time categorized).

^gSlope and standard error based on diastolic blood pressure versus log₂ dioxin.

--: Relative risk, confidence interval, and p-value not given due to the sparse number of abnormalities.

**: Covariate interaction with dioxin (log₂ [initial dioxin], log₂ [current dioxin] and time, categorized current dioxin) ($0.01 < p \leq 0.05$); summary statistics (adjusted mean, adjusted slope, adjusted standard error, adjusted relative risk, confidence interval and p-value) derived from a model fitted after deletion of this interaction.

**** Covariate interaction with dioxin (log₂ [initial dioxin], log₂ [current dioxin] and time, categorized current dioxin) ($p \leq 0.01$); summary statistics (adjusted mean, adjusted slope, adjusted standard error, adjusted relative risk, confidence interval and p-value) not presented.

Note: Initial Dioxin: Minimal-Low: 52-93 ppt; Medium: >93-292 ppt; High: >292 ppt.

Maximal--Low: 25-56.9 ppt; Medium: >56.9-218 ppt; High: >218 ppt.

Current Dioxin: Minimal-Low: >10-14.65 ppt; Medium: >14.65-45.75 ppt; High: >45.75 ppt.

Maximal-Low: >5-9.01 ppt; Medium: >9.01-33.3 ppt; High: >33.3 ppt.

Background (Comparisons): Current Dioxin \leq 10 ppt.

Unknown (Ranch Hands): Current Dioxin \leq 10 ppt.

Low (Ranch Hands): 15 ppt < Current Dioxin \leq 33.3 ppt.

High (Ranch Hands): Current Dioxin >33.3 ppt.

TABLE K-3.
Summary of Dioxin-by-Covariate Interactions Without Adjustment for
Percent Body Fat and Cholesterol for Cardiovascular Variables

Ranch Hands - Log2 (Initial Dioxin)							
Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Adj. Mean	Adj. Slope (Std. Error) ^a	p-Value
Systolic Blood Pressure (Continuous) (Minimal-- 12-7 [c])	Initial-by-Age	Born ≥1942 0	Low Medium High	12 25 26	128.80 135.43 131.01	0.736 (1.548)	0.635
		Born ≥1942 >0-10	Low Medium High	17 37 29	126.79 125.77 125.65	-0.377 (1.604)	0.814
		Born ≥1942 >10	Low Medium High	12 44 19	131.69 127.01 125.24	-2.835 (1.623)	0.081
	Initial-by-Lifetime Cigarette Smoking History	Born <1942 0	Low Medium High	20 30 11	128.78 128.54 134.12	2.645 (2.177)	0.225
		Born <1942 >0-10	Low Medium High	17 30 5	129.65 126.48 140.33	4.349 (2.591)	0.094
		Born <1942 >10	Low Medium High	32 58 22	131.74 131.38 136.62	1.330 (1.412)	0.347
Systolic Blood Pressure (Continuous) (Maximal-- 12-7 [d])	Initial-by-Lifetime Cigarette Smoking History	0	Low Medium High	58 85 48	128.04 129.87 135.50	2.243 (0.834)	0.007
		>0-10	Low Medium High	47 87 48	123.12 127.05 132.78	1.541 (0.933)	0.099
		>10	Low Medium High	68 148 58	131.61 131.16 131.05	-0.359 (0.749)	0.632

TABLE K-3. (Continued)
**Summary of Dioxin-by-Covariate Interactions Without Adjustment for
Percent Body Fat and Cholesterol for Cardiovascular Variables**
Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Adj. Mean	Contrast	Difference of Adj. Means (95% C.I.)	p-Value
Systolic Blood Pressure (Continuous) (12-7 [j])	Categorized Current Dioxin-by- Age	Born ≥1942	Background	289	125.42	A11		0.149
			Unknown	106	124.21	U vs. B	-1.21 (-5.02,2.60)	0.533
			Low	75	129.28	L vs. B	3.86 (-0.49,8.21)	0.082
			High	101	127.83	H vs. B	2.41 (-1.48,6.30)	0.225
	Born <1942		Background	378	131.51	A11		0.019
			Unknown	197	128.68	U vs. B	-2.83 (-5.79,0.12)	0.060
			Low	99	128.70	L vs. B	-2.81 (-6.60, 0.98)	0.146
			High	49	136.22	H vs. B	4.70 (-0.39,9.80)	0.071

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Percent Abnormal	Adj. Relative Risk (95% C.I.) ^b	p-Value
Systolic Blood Pressure (Discrete) (Minimal-- 12-8 [c])	Initial-by- Personality Type	Type A	Low	52	26.9	0.73 (0.51,1.05)	0.087
			Medium	95	17.9		
			High	44	11.4		
	Initial-by- Personality Type	Type B	Low	55	20.0	1.14 (0.88,1.47)	0.314
			Medium	123	21.1		
			High	64	26.6		

TABLE K-3. (Continued)

**Summary of Dioxin-by-Covariate Interactions Without Adjustment for
Percent Body Fat and Cholesterol for Cardiovascular Variables**

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Percent Abnormal/(n) <u>Current Dioxin</u>			Adj. Relative Risk (95% C.I.) ^b	p-Value
				Low	Medium	High		
Systolic Blood Pressure (Discrete) (Minimal-- 12-8 [g])	Current-by- Time-by- Personality	Type A	≤18.6	32.3 (31)	20.5 (44)	5.6 (18)	0.44 (0.22,0.88)	0.037 ^c 0.021 ^d
			>18.6	10.0 (20)	19.6 (51)	14.8 (27)	1.02 (0.66,1.59)	0.926 ^d
		Type B	≤18.6	12.0 (25)	12.1 (66)	36.0 (25)	1.66 (1.07,2.56)	0.015 ^c 0.023 ^d
	Current-by- Time-by- Personality	Type A	≤18.6	16.3 (49)	25.0 (76)	7.7 (26)	0.81 (0.55,1.19)	0.295 ^c 0.282 ^d
			>18.6	9.4 (32)	19.7 (71)	15.8 (38)	1.05 (0.77,1.45)	0.744 ^d
		Type B	≤18.6	14.9 (47)	10.6 (85)	29.0 (38)	1.42 (1.03,1.96)	0.045 ^c 0.031 ^d
			>18.6	23.5 (34)	27.5 (80)	25.0 (48)	0.93 (0.71,1.22)	0.599 ^d

TABLE K-3. (Continued)
Summary of Dioxin-by-Covariate Interactions Without Adjustment for
Percent Body Fat and Cholesterol for Cardiovascular Variables

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Percent Abnormal	Contrast	Adj. Relative Risk (95% C.I.)	p-Value
Systolic Blood Pressure (Discrete) 12-8 (μ J)	Categorized Current Dioxin-by- Age	Born ≥ 1942	Background	289	11.8	AII		0.109
			Unknown	105	9.5	U vs. B	0.79 (0.37,1.66)	0.529
			Low	75	21.3	L vs. B	2.01 (1.04,3.91)	0.038
			High	100	17.0	H vs. B	1.54 (0.82,2.92)	0.182
	Born <1942		Background	377	26.5	AII		0.095
			Unknown	196	20.4	U vs. B	0.74 (0.49,1.13)	0.159
			Low	98	16.3	L vs. B	0.53 (0.30,0.96)	0.037
			High	48	29.2	H vs. B	1.10 (0.56,2.14)	0.781

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Percent Abnormal/(n)			Adj. Relative Risk (95% C.I.) ^b	p-Value
				Current	Dioxin	Low		
ECG: Non-specific ST- and T-Wave Changes (Maximal-- 12-13 [h])	Current-by- Time-by-Age	Born ≥ 1942	≤ 18.6	8.7 (46)	4.9 (81)	2.0 (51)	0.72 (0.40,1.29)	0.705 ^c 0.269 ^d
				9.1 (11)	12.0 (50)	9.1 (55)		
			>18.6	10.5 (57)	16.4 (104)	21.9 (32)	0.83 (0.52,1.31)	0.421 ^d
				8.8 (57)	11.6 (86)	29.4 (17)		
	Born <1942		≤ 18.6	10.5 (57)	16.4 (104)	21.9 (32)	1.63 (1.04,2.54)	0.222 ^c 0.032 ^d
				8.8 (57)	11.6 (86)	29.4 (17)		
			>18.6	10.5 (57)	16.4 (104)	21.9 (32)	1.16 (0.84,1.59)	0.366 ^d
				10.5 (57)	16.4 (104)	21.9 (32)		

TABLE K-3. (Continued)
**Summary of Dioxin-by-Covariate Interactions Without Adjustment for
Percent Body Fat and Cholesterol for Cardiovascular Variables**
Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Percent Abnormal	Contrast	Adj. Relative Risk (95% C.I.)	p-Value
ECG: Bradycardia (12-14 [j])	Categorized Current Dioxin-by- Race	Black	Background	42	0.0	A11		0.005
			Unknown	11	18.2	U vs. B	--	0.080
			Low	9	11.1	L vs. B	--	0.352
			High	6	0.0	H vs. B	--	--
	Non- Black	Non- Black	Background	625	6.2	A11		0.118
			Unknown	292	5.5	U vs. B	0.93 (0.51,1.70)	0.805
			Low	165	3.0	L vs. B	0.46 (0.18,1.19)	0.110
			High	144	2.8	H vs. B	0.40 (0.14,1.14)	0.087

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Adj. Mean	Adj. Slope (Std. Error) ^e	p-Value
Diastolic Blood Pressure (Continuous) (12-17 [d])	Initial-by- Personality Type	Type A	Low	87	77.49	-0.453 (0.404)	0.263
			Medium	141	77.25		
			High	64	76.22		
	Type B	Type B	Low	77	75.32	1.074 (0.365)	0.003
			Medium	170	77.80		
			High	85	79.25		

TABLE K-3. (Continued)
Summary of Dioxin-by-Covariate Interactions Without Adjustment for
Percent Body Fat and Cholesterol for Cardiovascular Variables

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Adj. Mean	Contrast	Difference of Adj. Means (95% C.I.)	p-Value
Diastolic Blood Pressure (Continuous) (12-17 [μ])	Categorized Current Dioxin-by- Personality Type	Type A Yes	Background	52	74.79	All		0.246
			Unknown	34	73.76	U vs. B	-1.03 (-5.01,2.95)	0.611
			Low	14	79.60	L vs. B	4.81 (-0.62,10.23)	0.083
			High	12	75.50	H vs. B	0.71 (-5.07,6.48)	0.810
	Categorized Current Dioxin-by- Family History of Heart Disease	Type A No	Background	226	74.78	All		0.840
			Unknown	112	75.57	U vs. B	0.79 (-1.30,2.88)	0.460
			Low	59	75.30	L vs. B	0.52 (-2.11,3.16)	0.698
			High	50	74.37	H vs. B	-0.41 (-3.25,2.43)	0.777
	Type B Yes	Type B Yes	Background	86	74.38	All		<0.001
			Unknown	41	71.39	U vs. B	-2.99 (-6.42,0.43)	0.087
			Low	24	81.06	L vs. B	6.68 (2.52,10.84)	0.002
			High	20	77.40	H vs. B	3.01 (-1.46,7.49)	0.187
	Type B No	Type B No	Background	300	74.29	All		0.002
			Unknown	111	72.74	U vs. B	-1.55 (-3.55,0.45)	0.129
			Low	74	75.08	L vs. B	0.79 (-1.55,3.13)	0.507
			High	62	78.25	H vs. B	3.96 (1.43,6.50)	0.002

TABLE K-3. (Continued)

**Summary of Dioxin-by-Covariate Interactions Without Adjustment for
Percent Body Fat and Cholesterol for Cardiovascular Variables**

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Percent Abnormal	Adj. Relative Risk (95% C.I.) ^b	p-Value
Femoral Pulses (Minimal-- 12-22 [c])	Initial-by- Personality Type	Type A	Low	51	0.0	3.01 (1.01,8.92)	0.047
			Medium	95	0.0		
			High	41	4.9		
	Initial-by- Personality Type	Type B	Low	55	0.0	0.64 (0.28,1.49)	0.304
			Medium	122	6.6		
			High	63	0.0		
Femoral Pulses (Maximal-- 12-22 [d])	Initial-by- Personality Type	Type A	Low	87	0.0	2.73 (1.02,7.33)	0.047
			Medium	139	0.0		
			High	62	3.2		
	Initial-by- Personality Type	Type B	Low	76	2.6	0.86 (0.50,1.48)	0.589
			Medium	170	5.3		
			High	84	0.0		
Leg Pulses (Minimal-- 12-26 [c])	Initial-by- Age	Born ≥1942	Low	38	18.4	0.89 (0.63,1.26)	0.520
			Medium	103	10.7		
	Initial-by- Age	Born <1942	High	69	13.0	1.41 (1.04,1.93)	0.029
			Low	68	8.8		
			Medium	116	25.0		
			High	36	27.8		

TABLE K-3. (Continued)
**Summary of Dioxin-by-Covariate Interactions Without Adjustment for
Percent Body Fat and Cholesterol for Cardiovascular Variables**
Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Percent Abnormal/(n)			Adj. Relative Risk (95% C.I.) ^b	p-Value	
				Low	Medium	High			
Leg Pulses (Minimal-- 12-26 [g])	Current-by- Time-by- Lifetime Cigarette Smoking History	0	≤ 18.6	22.2 (18)	10.0 (30)	8.3 (12)	0.52 (0.19,1.43)	0.169 ^c	
				0.0 (11)	11.1 (27)	12.5 (24)		0.206 ^d	
		>0-10		20.0 (15)	14.0 (43)	23.5 (17)	1.17 (0.56,2.42)	0.678 ^d	
				18.2 (11)	25.0 (28)	28.6 (14)		0.170 ^d	
				0.0 (22)	18.4 (38)	14.3 (14)	1.68 (0.88,3.23)	0.807 ^c	
	>10	>10		23.1 (26)	24.1 (58)	13.6 (22)		0.118 ^d	
				0.0 (22)	18.4 (38)	14.3 (14)	2.71 (1.29,5.70)	0.003 ^c	
				23.1 (26)	24.1 (58)	13.6 (22)		0.008 ^d	
		>10		23.1 (26)	24.1 (58)	13.6 (22)	0.75 (0.47,1.20)	0.237 ^d	
				0.0 (22)	18.4 (38)	14.3 (14)			

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Percent Abnormal	Adj. Relative Risk (95% C.I.) ^b	p-Value
Peripheral and All Pulses (Minimal-- 12-27 [c])	Initial-by- Age	Born ≥ 1942	Low	38	21.1	0.86 (0.61,1.22)	0.394
			Medium	103	10.7		
	<1942		High	69	13.0		
	Born < 1942	Low	68	8.8	1.41 (1.04,1.92)	0.029	
		Medium	116	25.0			
		High	36	27.8			

TABLE K-3. (Continued)

**Summary of Dioxin-by-Covariate Interactions Without Adjustment for
Percent Body Fat and Cholesterol for Cardiovascular Variables**

^aAdjusted slope and standard error based on systolic blood pressure versus log₂ dioxin.

^bRelative risk for a twofold increase in dioxin.

^cTest of significance for homogeneity of relative risks (current dioxin continuous, time categorized).

^dTest of significance for relative risk equal to 1 (current dioxin continuous, time categorized).

^eAdjusted slope and standard error based on diastolic blood pressure versus log₂ dioxin.

--: Adjusted relative risk/confidence interval/p-value not presented due to the sparse number of abnormalities.

Note: Initial Dioxin: Minimal-Low: 52-93 ppt; Medium: >93-292 ppt; High: >292 ppt.

Maximal-Low: 25-56.9 ppt; Medium: >56.9-218 ppt; High: >218 ppt.

Current Dioxin: Minimal-Low: >10-14.65 ppt; Medium: >14.65-45.75 ppt; High: >45.75 ppt.

Maximal-Low: >5-9.01 ppt; Medium: >9.01-33.3 ppt; High: >33.3 ppt.

All: All categories.

Background (B) (Comparisons): Current Dioxin \leq 10 ppt.

Unknown (U) (Ranch Hands): Current Dioxin \leq 10 ppt.

Low (L) (Ranch Hands): 15 ppt < Current Dioxin \leq 33.3 ppt.

High (H) (Ranch Hands): Current Dioxin >33.3 ppt.

TABLE K-4.
Analysis of Verified Myocardial Infarction
(Diabetics Only)

Ranch Hands - Log₂ (Initial Dioxin) - Unadjusted

<u>Assumption</u>	<u>Initial Dioxin</u>	<u>n</u>	<u>Percent Yes</u>	<u>Est. Relative Risk (95% C.I.)^a</u>	<u>p-Value</u>
a) Minimal (n=63)	Low	13	7.7	0.74 (0.40,1.36)	0.299
	Medium	31	19.4		
	High	19	5.3		
b) Maximal (n=79)	Low	10	0.0	0.90 (0.55,1.46)	0.650
	Medium	38	18.4		
	High	31	6.5		

Ranch Hands - Log₂ (Initial Dioxin) - Adjusted

<u>Assumption</u>	<u>Adj. Relative Risk (95% C.I.)^a</u>	<u>p-Value</u>	<u>Covariate Remarks</u>
c) Minimal (n=63)	0.98 (0.50,1.94)	0.962	AGE (p=0.010)
d) Maximal (n=79)	1.18 (0.67,2.09)	0.564	AGE (p=0.003)

^aRelative risk for a twofold increase in dioxin.

Note: Minimal--Low: 52-93 ppt; Medium: >93-292 ppt; High: >292 ppt.
Maximal--Low: 25-56.9 ppt; Medium: >56.9-218 ppt; High: >218 ppt.

TABLE K-4. (Continued)
Analysis of Verified Myocardial Infarction
(Diabetics Only)

Ranch Hands - Log₂ (Current Dioxin) and Time - Unadjusted

Assumption	Time (Yrs.)	Percent Yes/(n) <u>Current Dioxin</u>			Est. Relative Risk (95% C.I.) ^a	p-Value
		Low	Medium	High		
e) Minimal (n=63)	≤18.6	10.0 (10)	9.1 (11)	0.0 (7)	0.46 (0.08,2.66)	0.647 ^b
	>18.6	16.7 (6)	25.0 (16)	7.7 (13)	0.70 (0.35,1.40)	0.379 ^c
	≤18.6	0.0 (3)	11.8 (17)	0.0 (14)	0.69 (0.18,2.67)	0.311 ^c
	>18.6	14.3 (7)	19.1 (21)	11.8 (17)	0.88 (0.53,1.46)	0.730 ^b
f) Maximal (n=79)	≤18.6	0.0 (3)	11.8 (17)	0.0 (14)	0.69 (0.18,2.67)	0.589 ^c
	>18.6	14.3 (7)	19.1 (21)	11.8 (17)	0.88 (0.53,1.46)	0.629 ^c

Ranch Hands - Log₂ (Current Dioxin) and Time - Adjusted

Assumption	Time (Yrs.)	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
g) Minimal (n=63)	≤18.6	0.58 (0.08,4.36)	0.615 ^b	AGE (p=0.021)
	>18.6		0.589 ^c	
		0.96 (0.46,1.99)	0.904 ^c	
h) Maximal (n=79)	≤18.6	0.89 (0.19,4.22)	0.698 ^b	AGE (p=0.005)
	>18.6		0.876 ^c	
		1.20 (0.66,2.18)	0.547 ^c	

^aRelative risk for a twofold increase in dioxin.

^bTest of significance for homogeneity of relative risks (current dioxin continuous, time categorized).

^cTest of significance for relative risk equal to 1 (current dioxin continuous, time categorized).

Note: Minimal--Low: >10-14.65 ppt; Medium: >14.65-45.75 ppt; High: >45.75 ppt.

Maximal--Low: >5-9.01 ppt; Medium: >9.01-33.3 ppt; High: >33.3 ppt.

TABLE K-4. (Continued)
**Analysis of Verified Myocardial Infarction
(Diabetics Only)**
i) Ranch Hands and Comparisons by Current Dioxin Category - Unadjusted

Current Dioxin Category	n	Percent Yes	Contrast	Est. Relative Risk (95% C.I.)	p-Value
Background	61	9.8	All Categories		0.223
Unknown	19	5.3	Unknown vs. Background	0.51 (0.06,4.62)	0.545
Low	15	26.7	Low vs. Background	3.33 (0.79,13.81)	0.097
High	31	6.5	High vs. Background	0.63 (0.12,3.39)	0.589
Total	126				

j) Ranch Hands and Comparisons by Current Dioxin Category - Adjusted

Current Dioxin Category	n	Contrast	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
Background	61	All Categories		0.358	AGE (p=0.045)
Unknown	19	Unknown vs. Background	0.37 (0.04,3.53)	0.381	
Low	15	Low vs. Background	2.36 (0.52,10.52)	0.263	
High	31	High vs. Background	0.71 (0.13,3.89)	0.688	
Total	126				

Note: Background (Comparisons): Current Dioxin \leq 10 ppt.
 Unknown (Ranch Hands): Current Dioxin \leq 10 ppt.
 Low (Ranch Hands): 15 ppt < Current Dioxin \leq 33.3 ppt.
 High (Ranch Hands): Current Dioxin >33.3 ppt.

TABLE K-5.
Analysis of Leg Pulses
(Diabetics Only)

Ranch Hands - Log₂ (Initial Dioxin) - Unadjusted

Assumption	Initial Dioxin	n	Percent Abnormal	Est. Relative Risk (95% C.I.) ^a	p-Value
a) Minimal (n=57)	Low	12	16.7	0.92 (0.60,1.41)	0.686
	Medium	27	33.3		
	High	18	16.7		
b) Maximal (n=72)	Low	10	10.0	0.99 (0.69,1.40)	0.943
	Medium	32	37.5		
	High	30	13.3		

Ranch Hands - Log₂ (Initial Dioxin) - Adjusted

Assumption	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
c) Minimal (n=57)	1.14 (0.71,1.84)	0.575	AGE (p=0.011)
d) Maximal (n=72)	1.13 (0.76,1.68)	0.531	AGE (p=0.041)

*Relative risk for a twofold increase in dioxin.

Note: Minimal--Low: 52-93 ppt; Medium: >93-292 ppt; High: >292 ppt.
Maximal--Low: 25-56.9 ppt; Medium: >56.9-218 ppt; High: >218 ppt.

TABLE K-5. (Continued)**Analysis of Leg Pulses
(Diabetics Only)****Ranch Hands - Log₂ (Current Dioxin) and Time - Unadjusted**

Assumption	Time (Yrs.)	Percent Abnormal/(n) <u>Current Dioxin</u>			Est. Relative Risk (95% C.I.) ^a	p-Value
		Low	Medium	High		
e) Minimal (n=57)	≤18.6	20.0 (10)	37.5 (8)	14.3 (7)	1.01 (0.49,2.09)	0.716 ^b
	>18.6	20.0 (5)	33.3 (15)	16.7 (12)	0.85 (0.49,1.49)	0.575 ^c
	≤18.6	0.0 (3)	18.8 (16)	25.0 (12)	1.25 (0.66,2.40)	0.355 ^b
	>18.6	14.3 (7)	44.4 (18)	12.5 (16)	0.87 (0.57,1.33)	0.530 ^c
f) Maximal (n=72)	≤18.6	0.0 (3)	18.8 (16)	25.0 (12)	1.25 (0.66,2.40)	0.487 ^c
	>18.6	14.3 (7)	44.4 (18)	12.5 (16)	0.87 (0.57,1.33)	0.530 ^c

Ranch Hands - Log₂ (Current Dioxin) and Time - Adjusted

Assumption	Time (Yrs.)	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
g) Minimal (n=57)	≤18.6	1.37 (0.61,3.07)	0.585 ^b	AGE (p=0.010)
	>18.6	1.05 (0.57,1.92)	0.432 ^c	
			0.873 ^c	
h) Maximal (n=72)	≤18.6	1.51 (0.75,3.04)	0.304 ^b	AGE (p=0.043)
	>18.6	0.99 (0.62,1.58)	0.243 ^c	
			0.971 ^c	

^aRelative risk for a twofold increase in dioxin.^bTest of significance for homogeneity of relative risks (current dioxin continuous, time categorized).^cTest of significance for relative risk equal to 1 (current dioxin continuous, time categorized).Note: Minimal--Low: >10-14.65 ppt; Medium: >14.65-45.75 ppt; High: >45.75 ppt.Maximal--Low: >5-9.01 ppt; Medium: >9.01-33.3 ppt; High: >33.3 ppt.

TABLE K-5. (Continued)
Analysis of Leg Pulses
(Diabetics Only)
i) Ranch Hands and Comparisons by Current Dioxin Category - Unadjusted

Current Dioxin Category	n	Percent Abnormal	Contrast	Est. Relative Risk (95% C.I.)	p-Value
Background	60	18.3	All Categories		0.258
Unknown	18	16.7	Unknown vs. Background	0.89 (0.22,3.67)	0.871
Low	14	42.9	Low vs. Background	3.34 (0.95,11.59)	0.057
High	28	17.9	High vs. Background	0.97 (0.30,3.15)	0.957
Total	120				

j) Ranch Hands and Comparisons by Current Dioxin Category - Adjusted

Current Dioxin Category	n	Contrast	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
Background	60	All Categories		0.380	AGE (p=0.125)
Unknown	18	Unknown vs. Background	0.75 (0.18,3.22)	0.699	
Low	14	Low vs. Background	2.76 (0.76,9.94)	0.119	
High	28	High vs. Background	1.01 (0.31,3.31)	0.992	
Total	120				

Note: Background (Comparisons): Current Dioxin \leq 10 ppt.
 Unknown (Ranch Hands): Current Dioxin \leq 10 ppt.
 Low (Ranch Hands): 15 ppt < Current Dioxin \leq 33.3 ppt.
 High (Ranch Hands): Current Dioxin >33.3 ppt.

APPENDIX K-1.
Data Displays for the Cardiovascular Assessment

The following figures graphically display relationships between the dependent variables and measures of dioxin for the cardiovascular assessment. The panels are arranged as follows:

Panel	Group	Assumption	Dioxin Measure
a	Ranch Hand	Minimal	Initial
b	Ranch Hand	Maximal	Initial
c	Comparison	--	Current
d	Ranch Hand	--	Current

Dioxin measures are presented in original units, but spacing of intervals is based on the logarithm (base 2) scale, similar to the statistical analysis. The dependent variable is also presented in original units, but spacing is based on the scale used for analysis, as described in the chapter. For continuous variables, current dioxin values of 0.0 ppt are displayed as 0.3 ppt. For these variables, the reference line indicates the general relationship, unadjusted for any covariates, between the dependent variable and \log_2 dioxin. For discrete variables, the percent of participants that exhibited an abnormal condition is displayed on the vertical axis for given intervals of dioxin. The intervals of dioxin and the sample sizes for each of these intervals are given below. A list of figures found in this appendix follows the table. These sample sizes are based on excluding participants with a verified history of diabetes, a 2-hour postprandial glucose level of 200 mg/dl or more, or a verified pre-SEA heart condition. Sample sizes for an individual variable may differ due to other exclusions or missing data.

Dioxin Interval	Dioxin Scale Midpoint	Panel			
		a	b	c	d
0.0-0.5	0.25	0	0	42	8
>0.5-2.0	1	0	0	28	8
>2.0-8.0	4	0	0	681	249
>8.0-32.0	16	0	23	52	408
>32.0-128.0	64	219	417	1	158
>128.0-512.0	256	234	234	0	33
>512.0-2,048	1024	65	65	0	2
>2,048.0	4096	3	3	0	0

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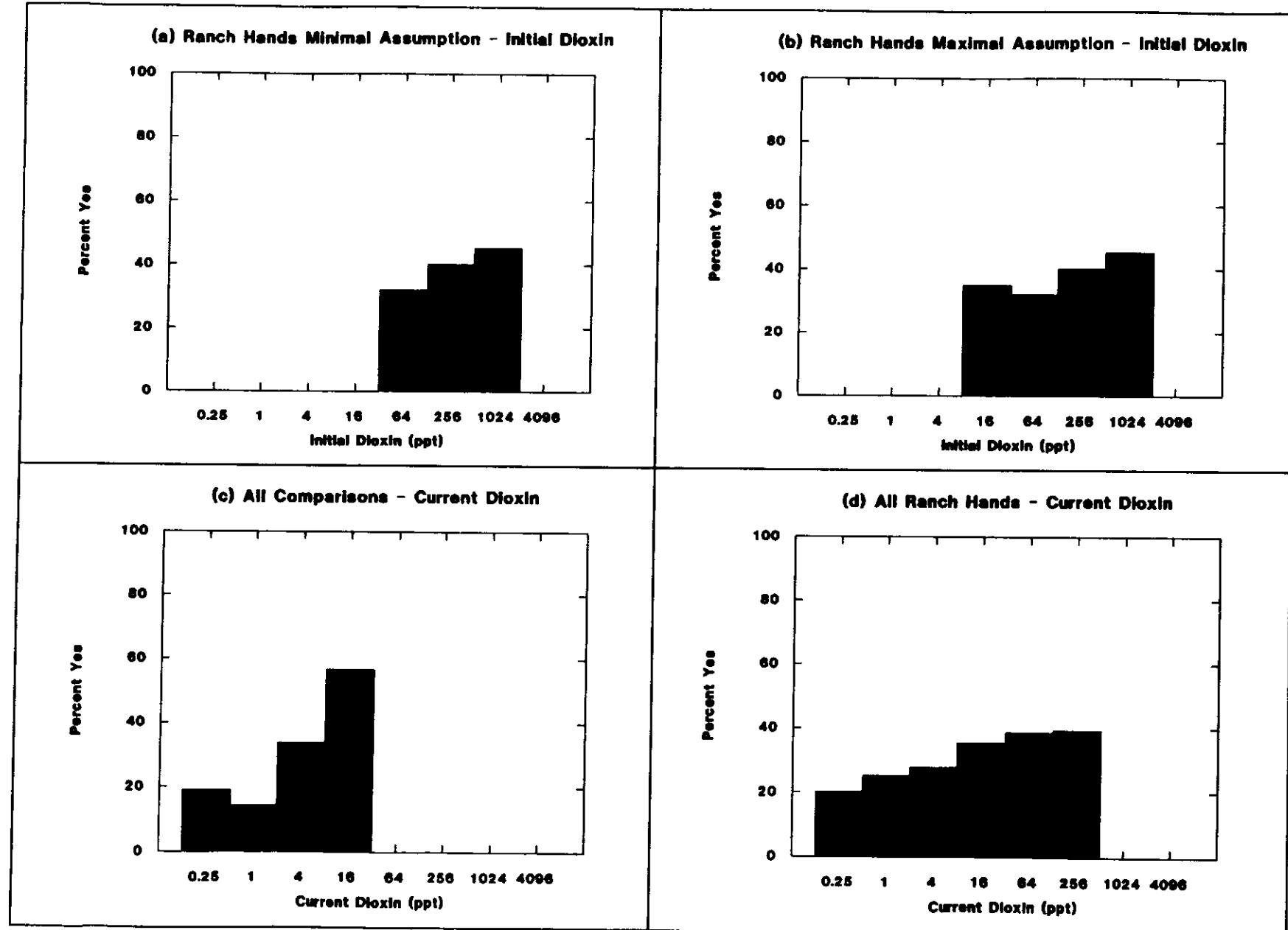


FIGURE K-1-1. Reported/Verified Essential Hypertension versus Dioxin

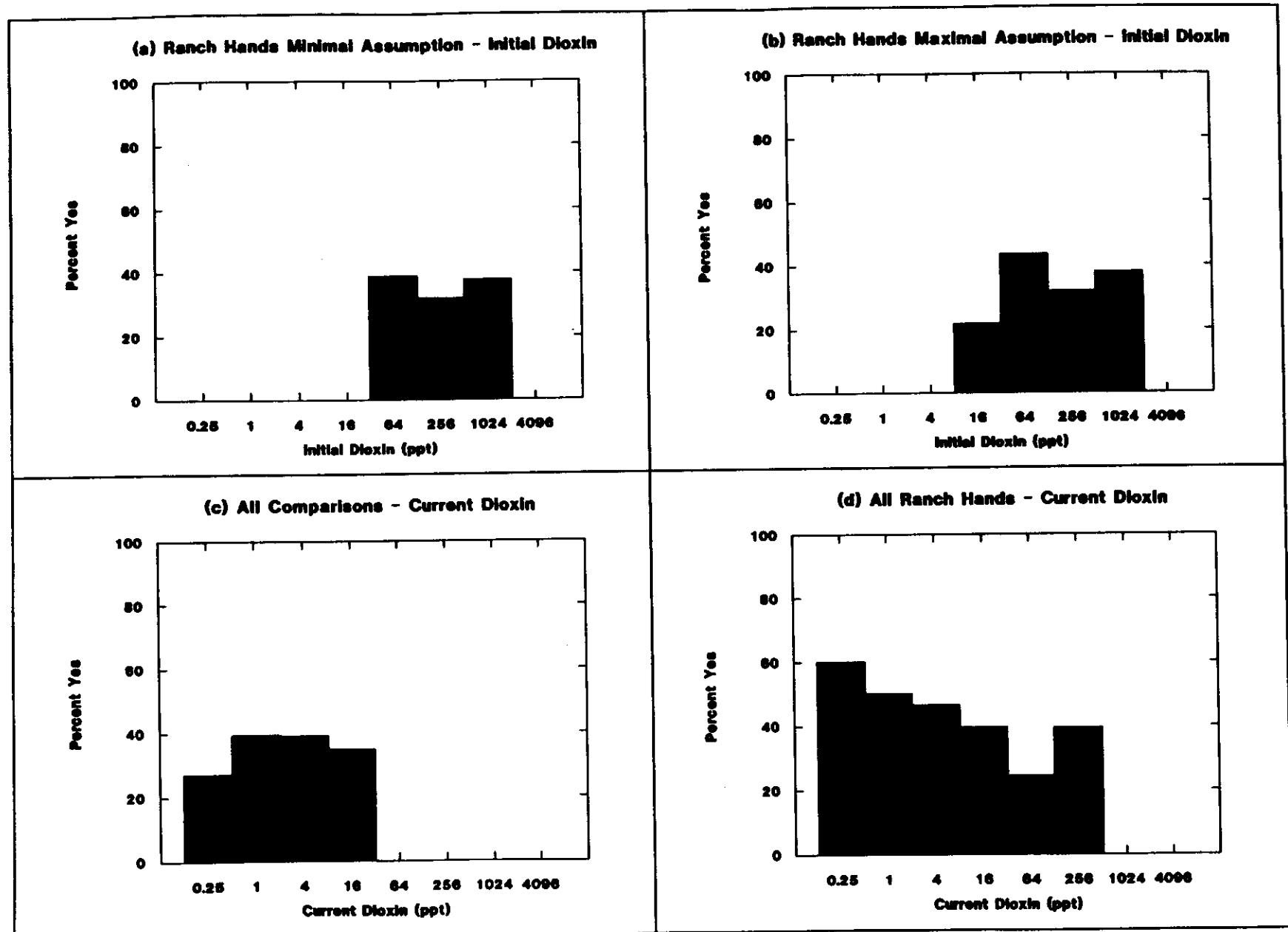


FIGURE K-1-2. Reported Heart Disease (excluding Essential Hypertension) versus Dioxin

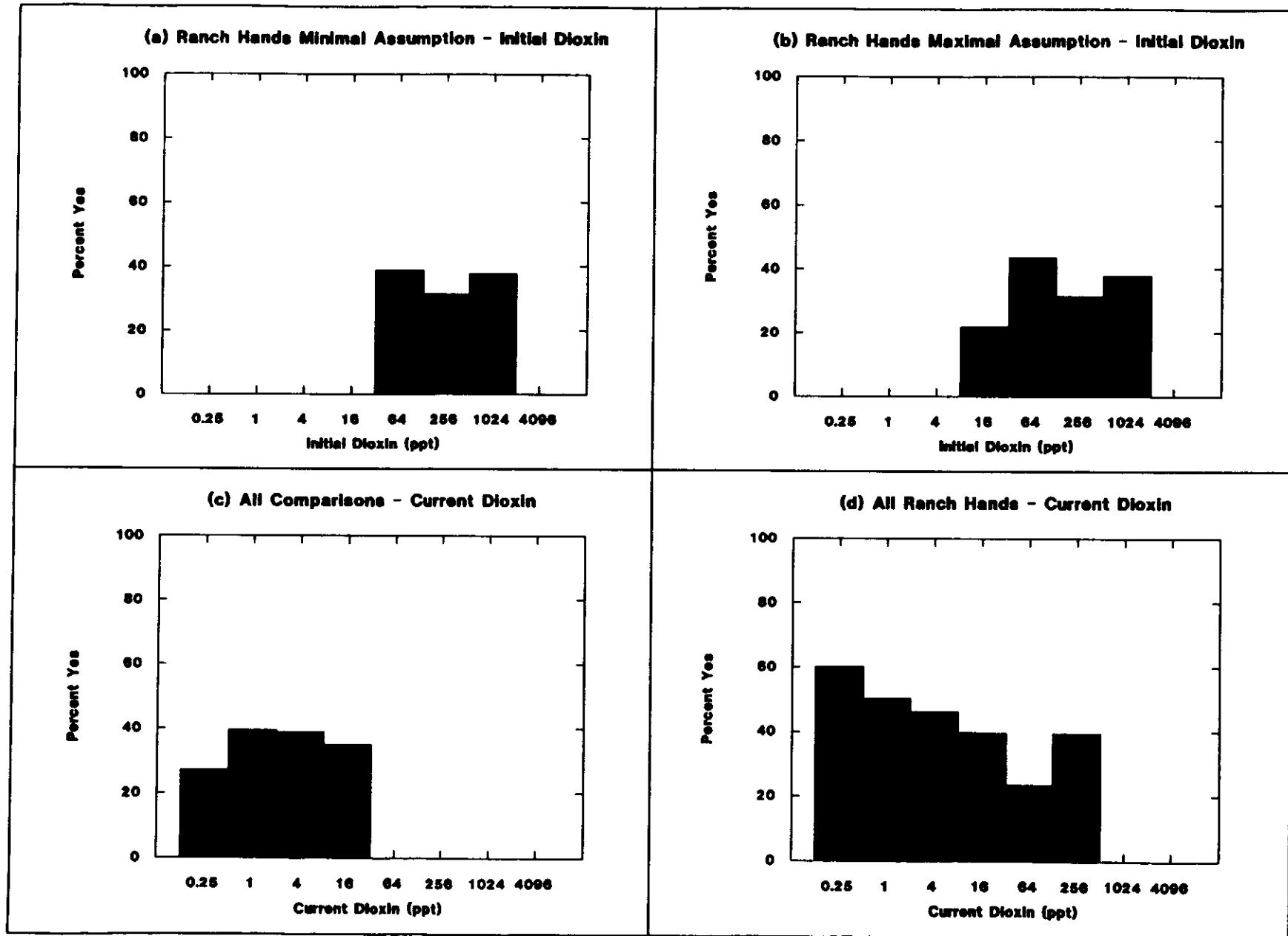


FIGURE K-1-3. Verified Heart Disease (excluding Essential Hypertension) versus Dioxin

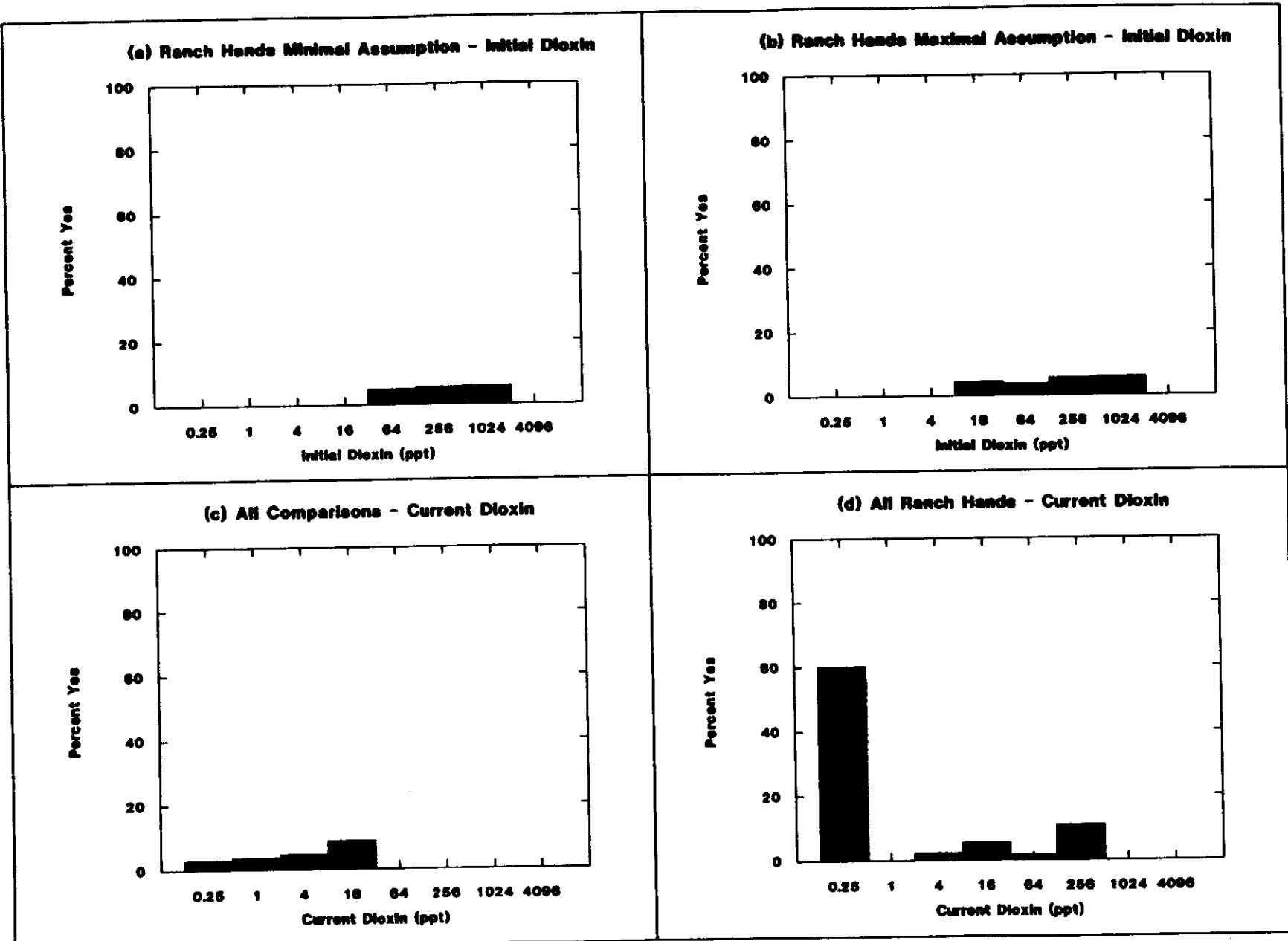


FIGURE K-1-4. Reported/Verified Myocardial Infarction versus Dioxin

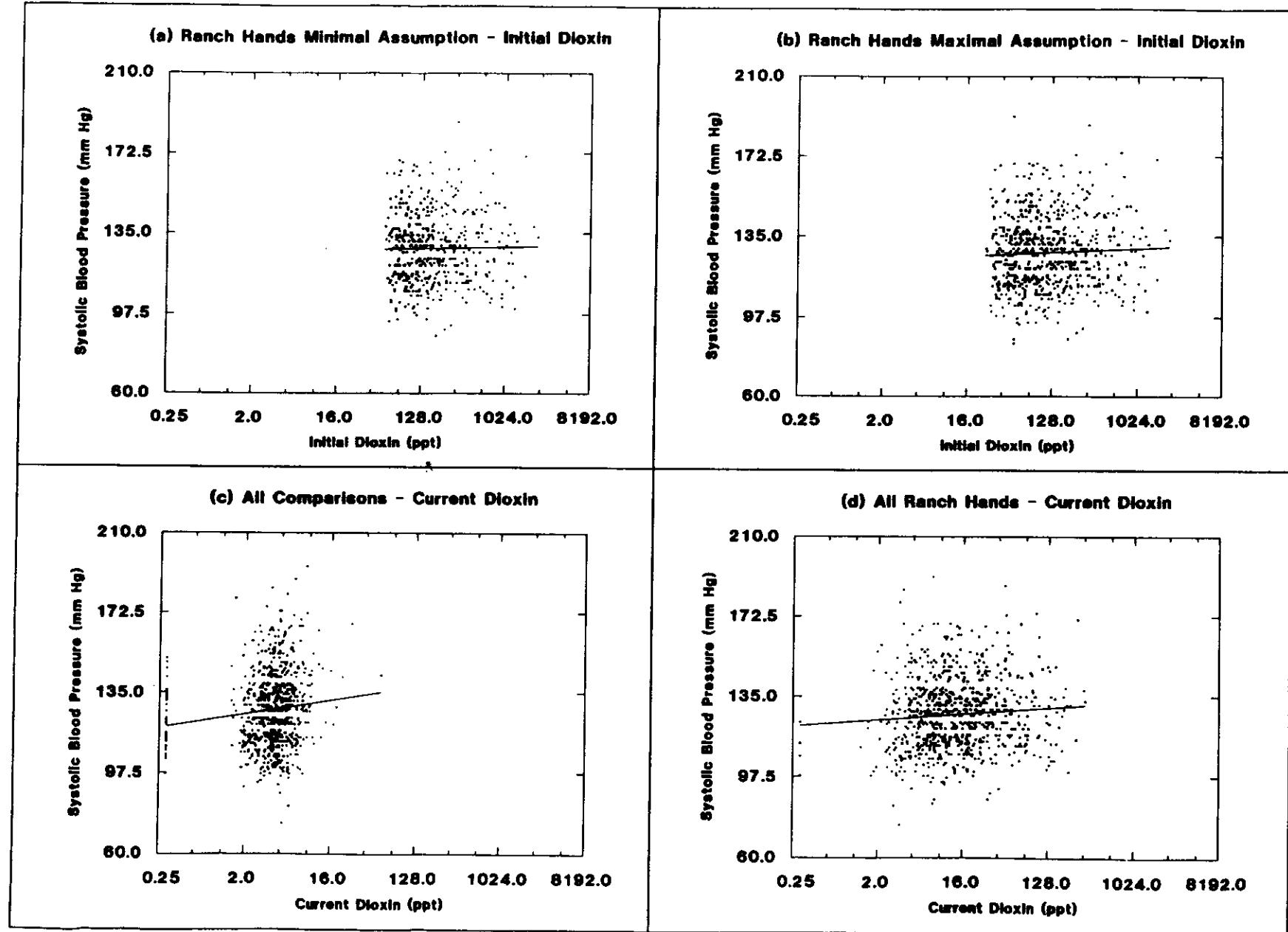


FIGURE K-1-5. Systolic Blood Pressure (Continuous) versus Dioxin

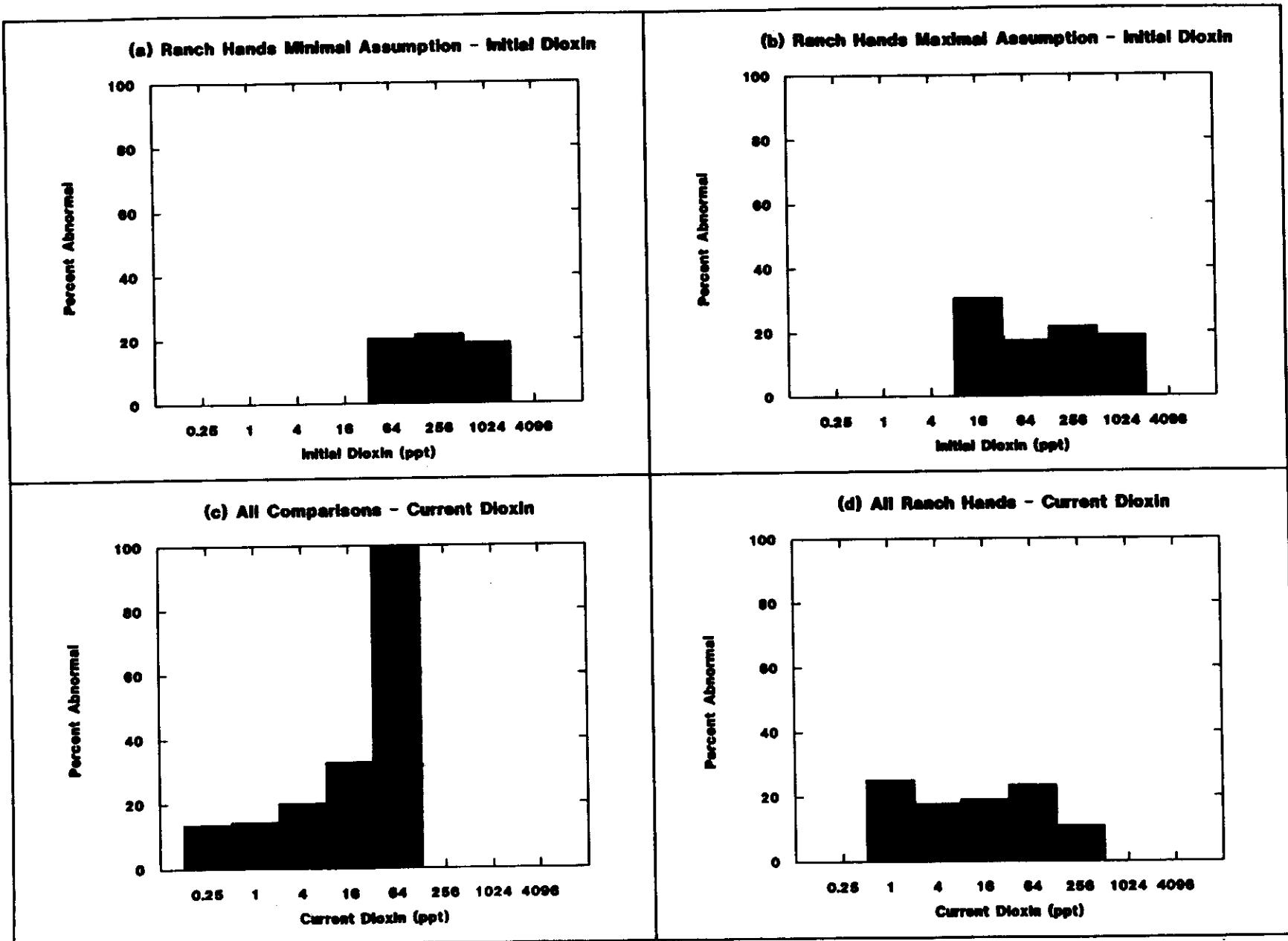


FIGURE K-1-6. Systolic Blood Pressure (Discrete) versus Dioxin

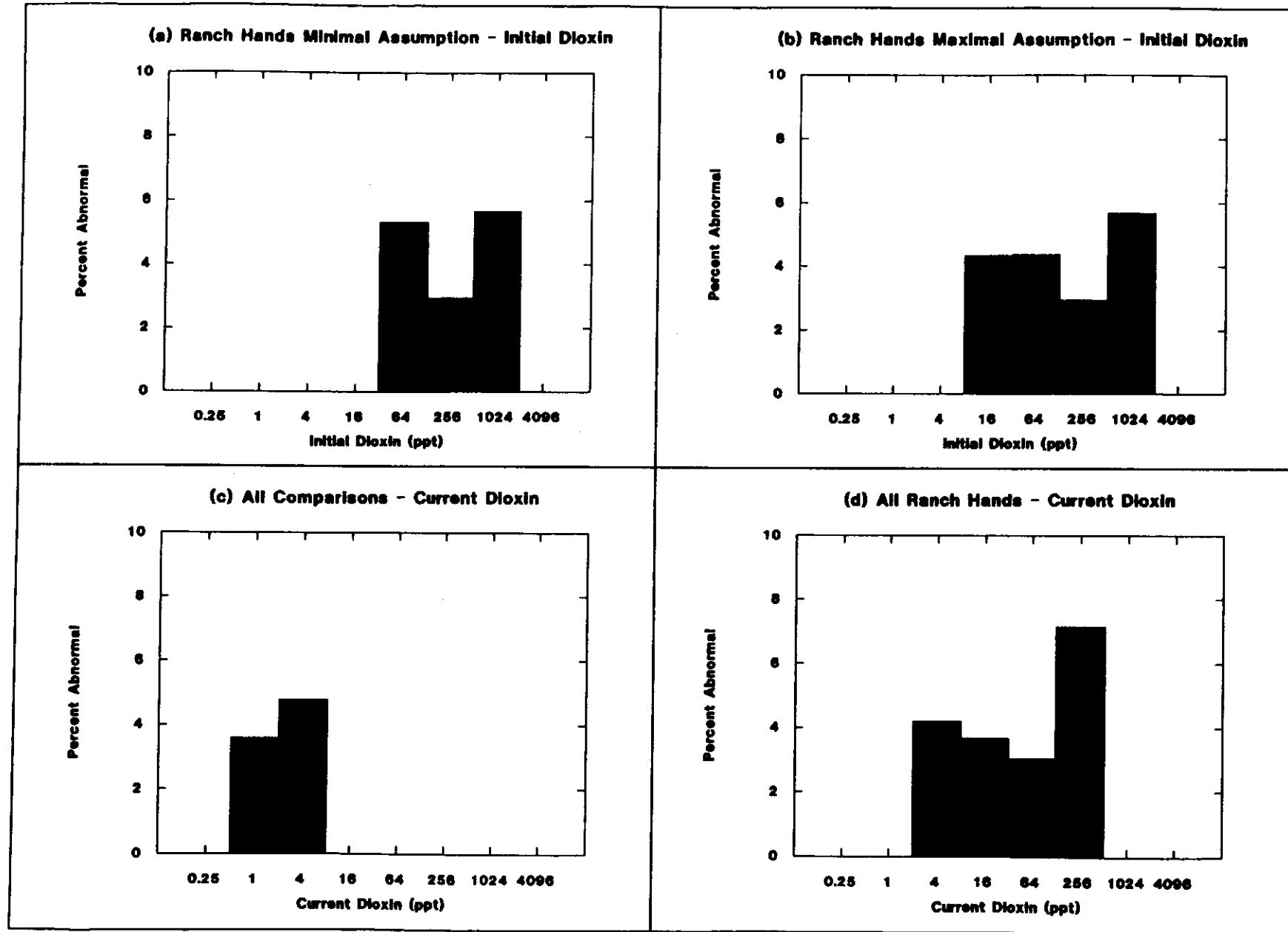


FIGURE K-1-7. Heart Sounds versus Dioxin

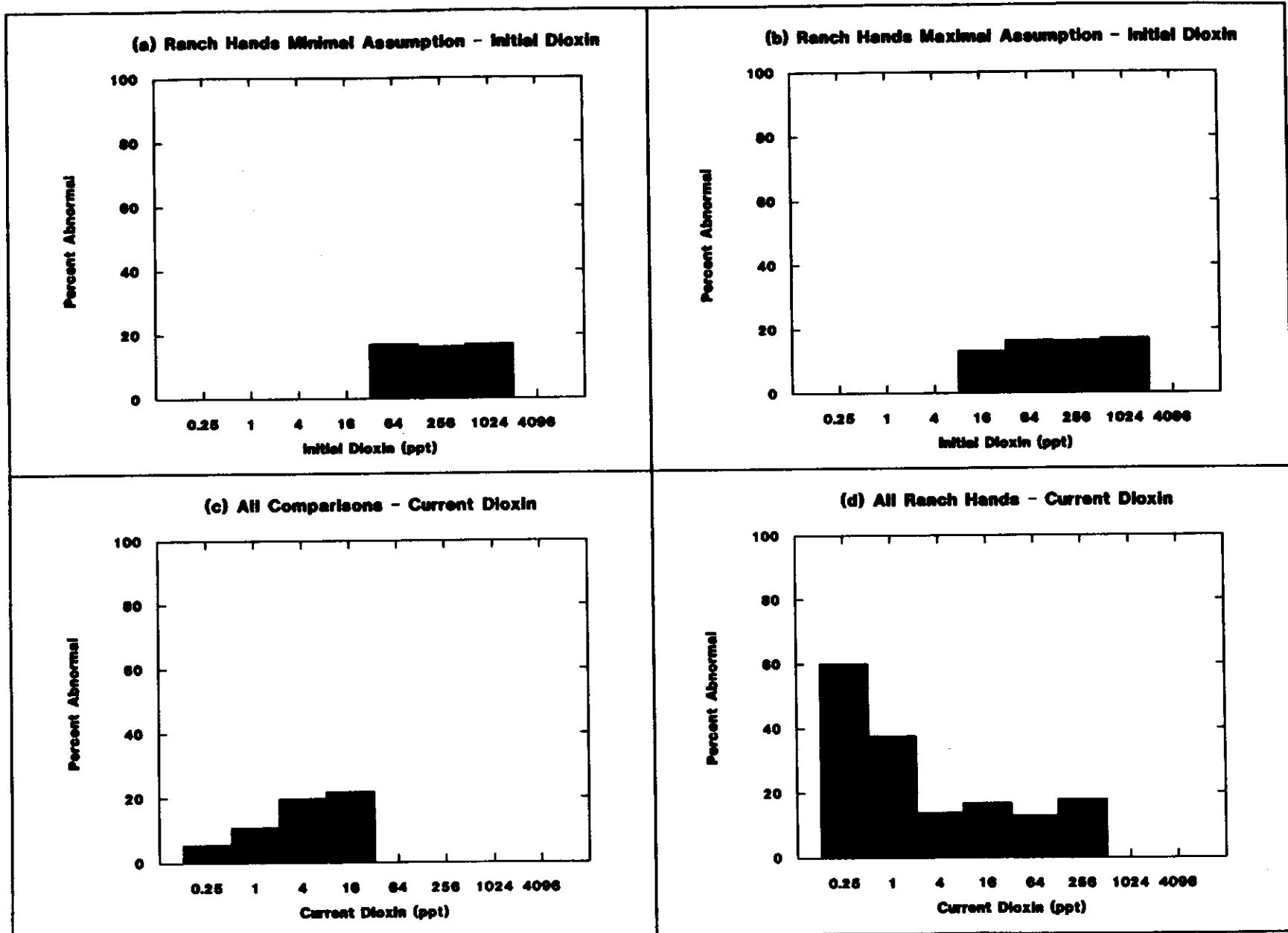


FIGURE K-1-8. Overall Electrocardiograph (ECG) versus Dioxin

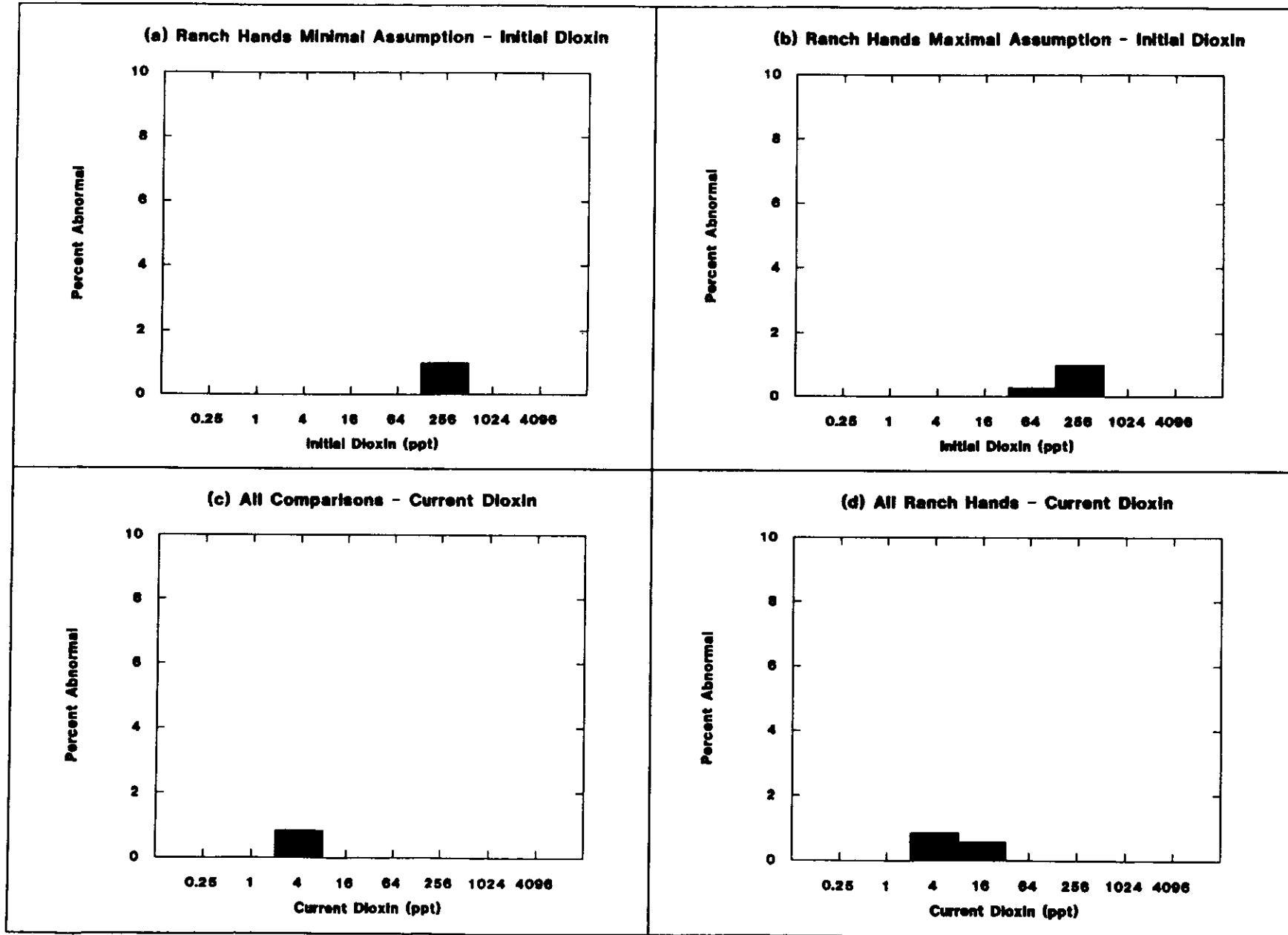


FIGURE K-1-9. ECG: Right Bundle Branch Block versus Dioxin

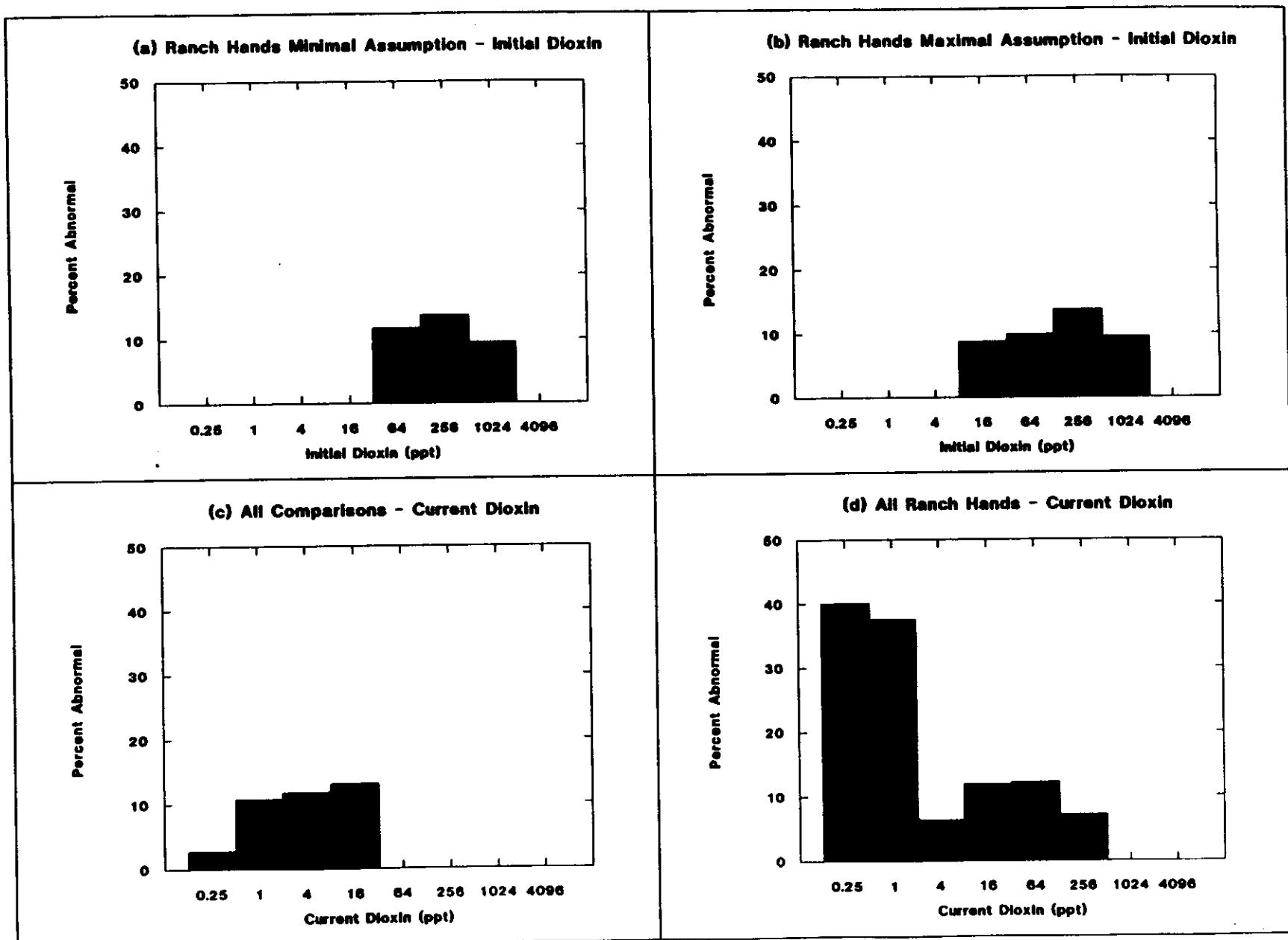


FIGURE K-1-10. ECG: Nonspecific ST- and T-Wave Changes versus Dioxin

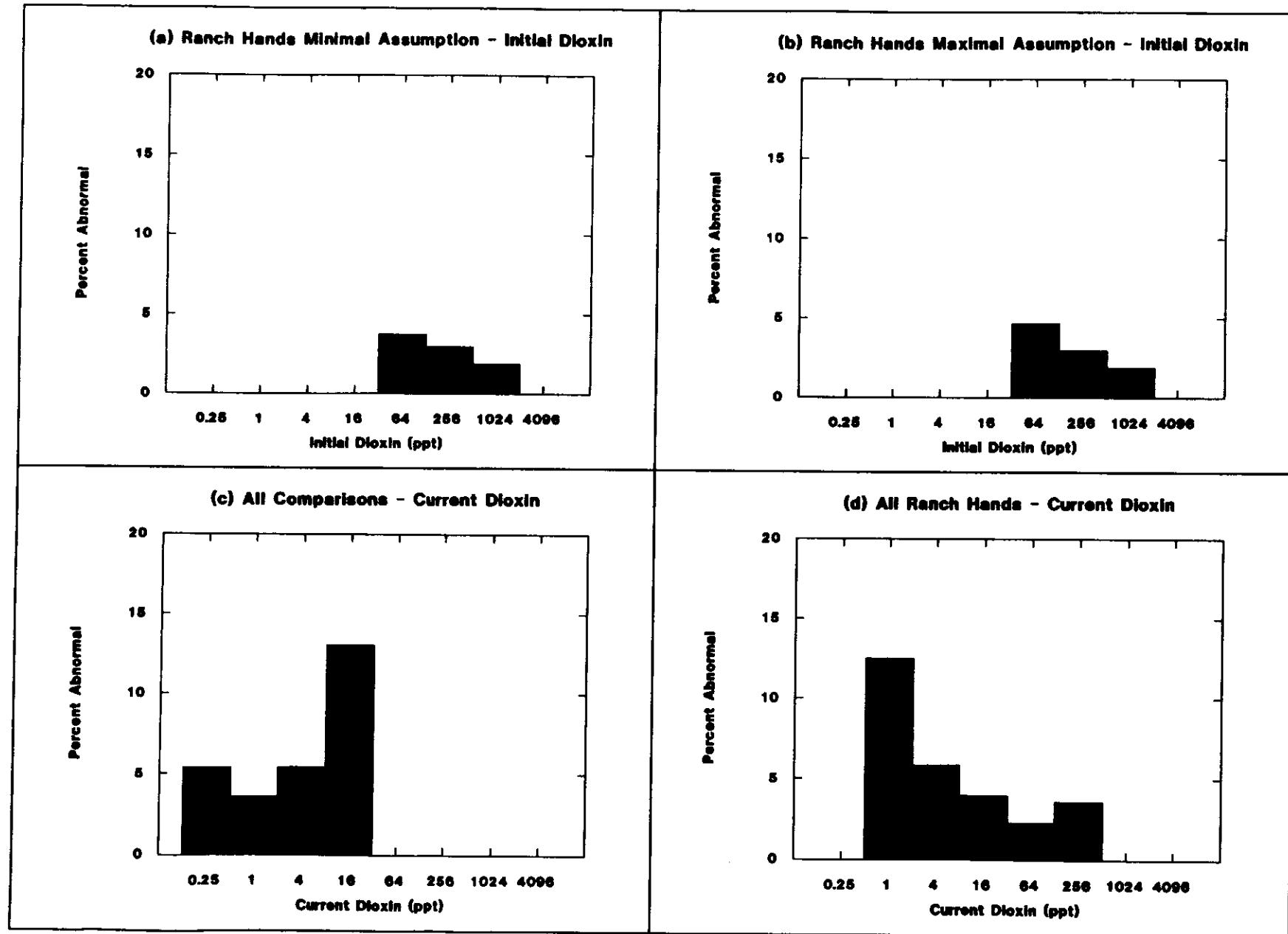


FIGURE K-1-11. ECG: Bradycardia versus Dioxin

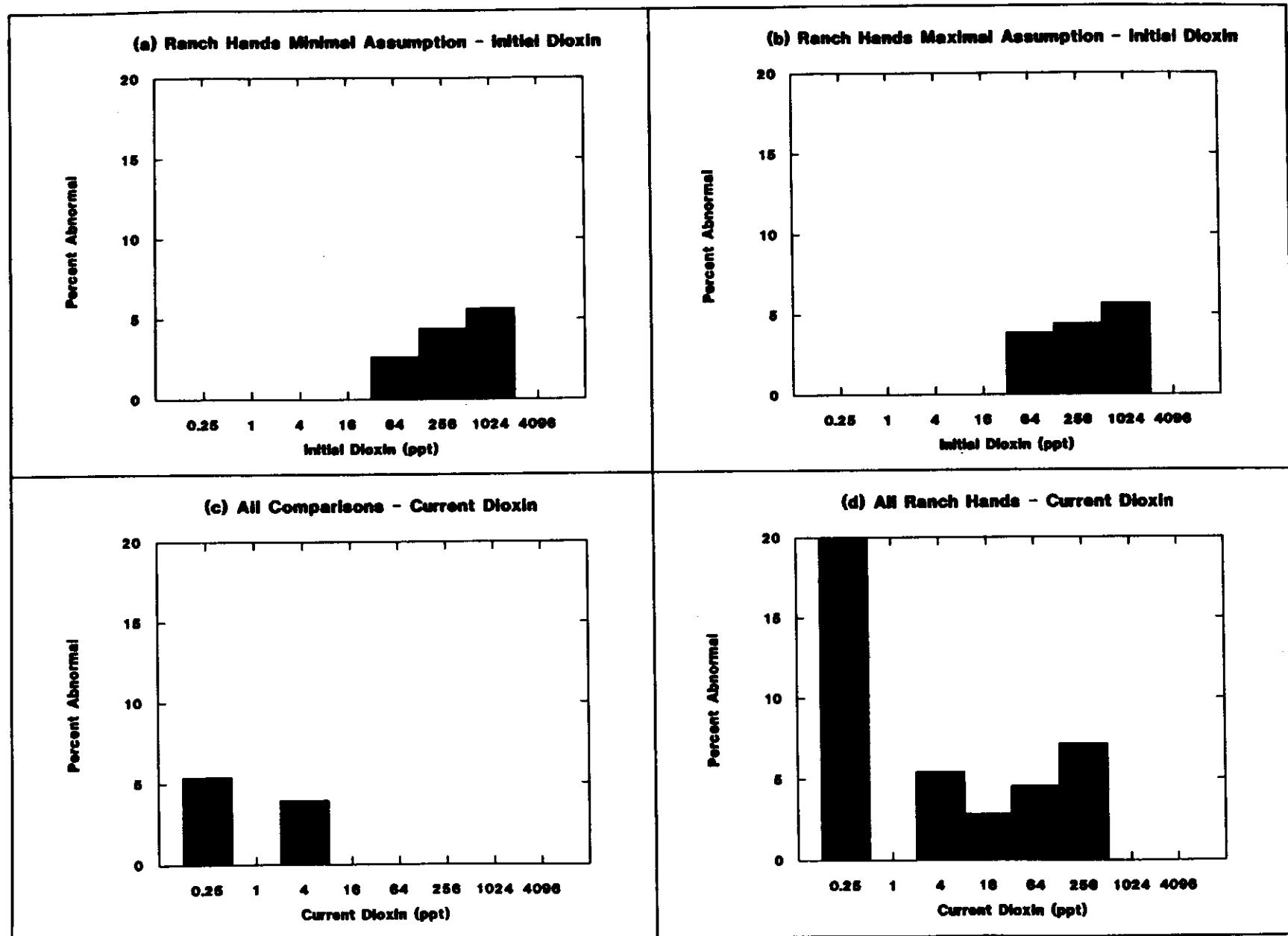


FIGURE K-1-12. ECG: Arrhythmia versus Dioxin

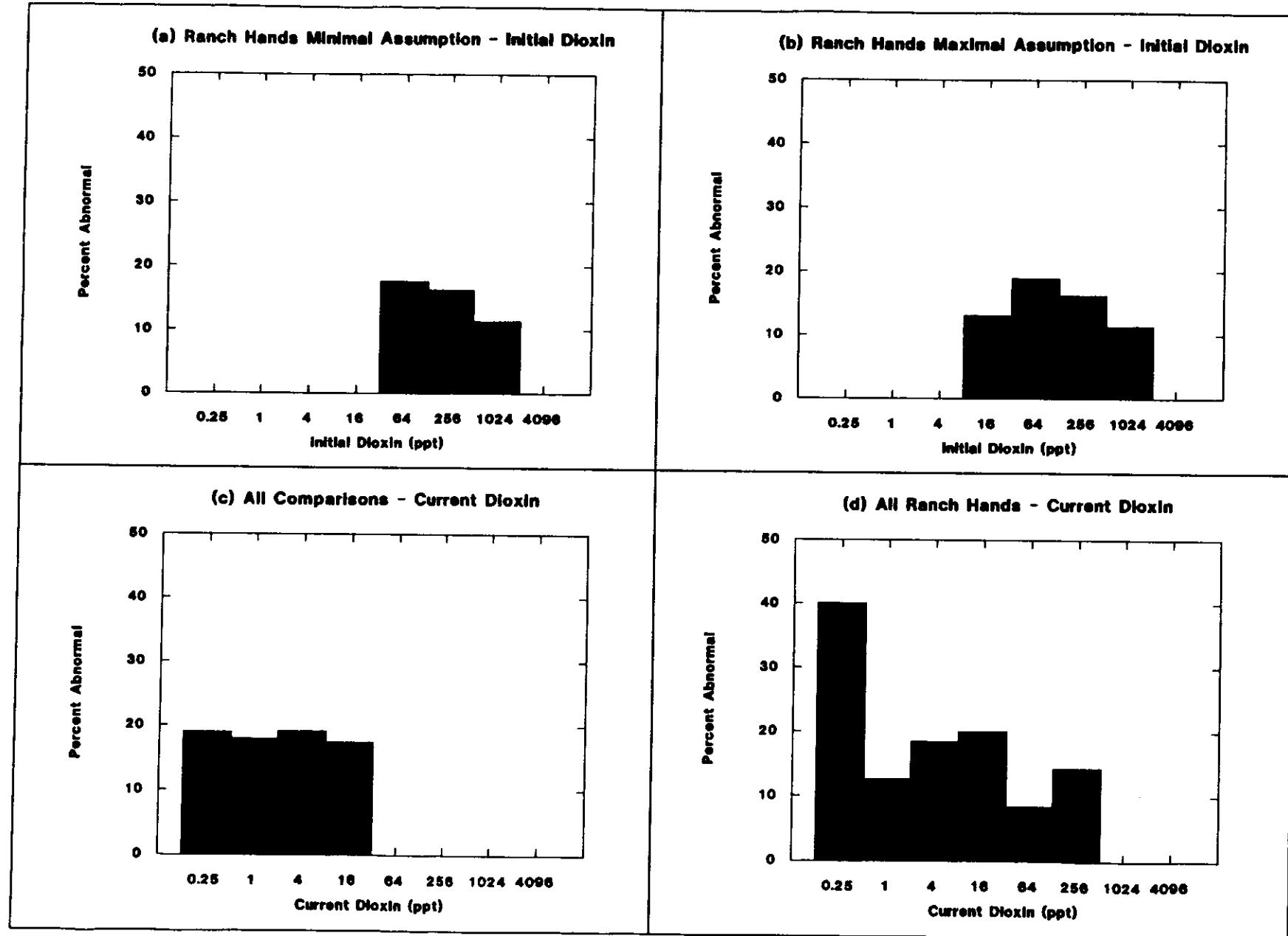


FIGURE K-1-13. ECG: Other Diagnoses versus Dioxin

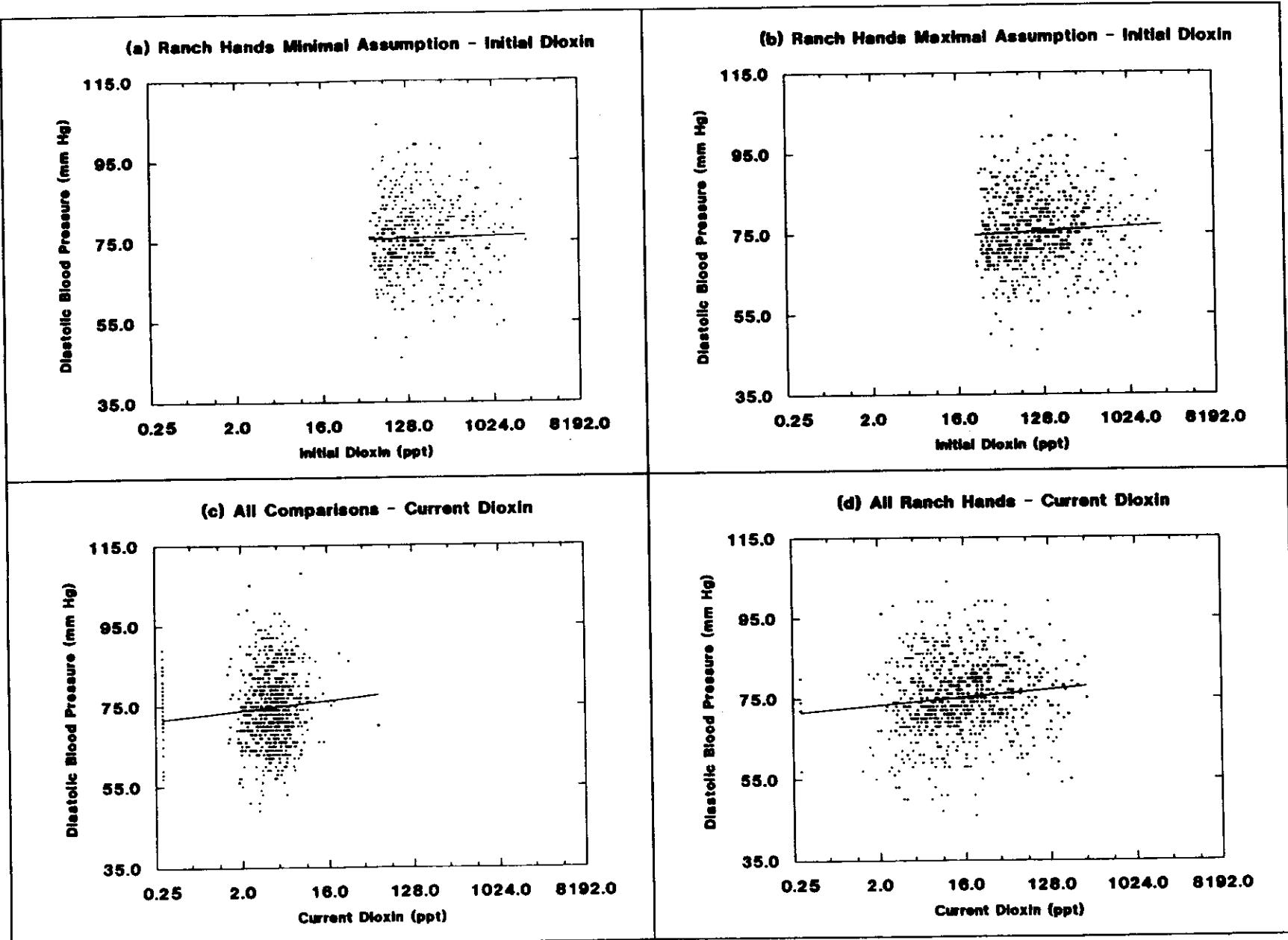


FIGURE K-1-14. Diastolic Blood Pressure (Continuous) versus Dioxin

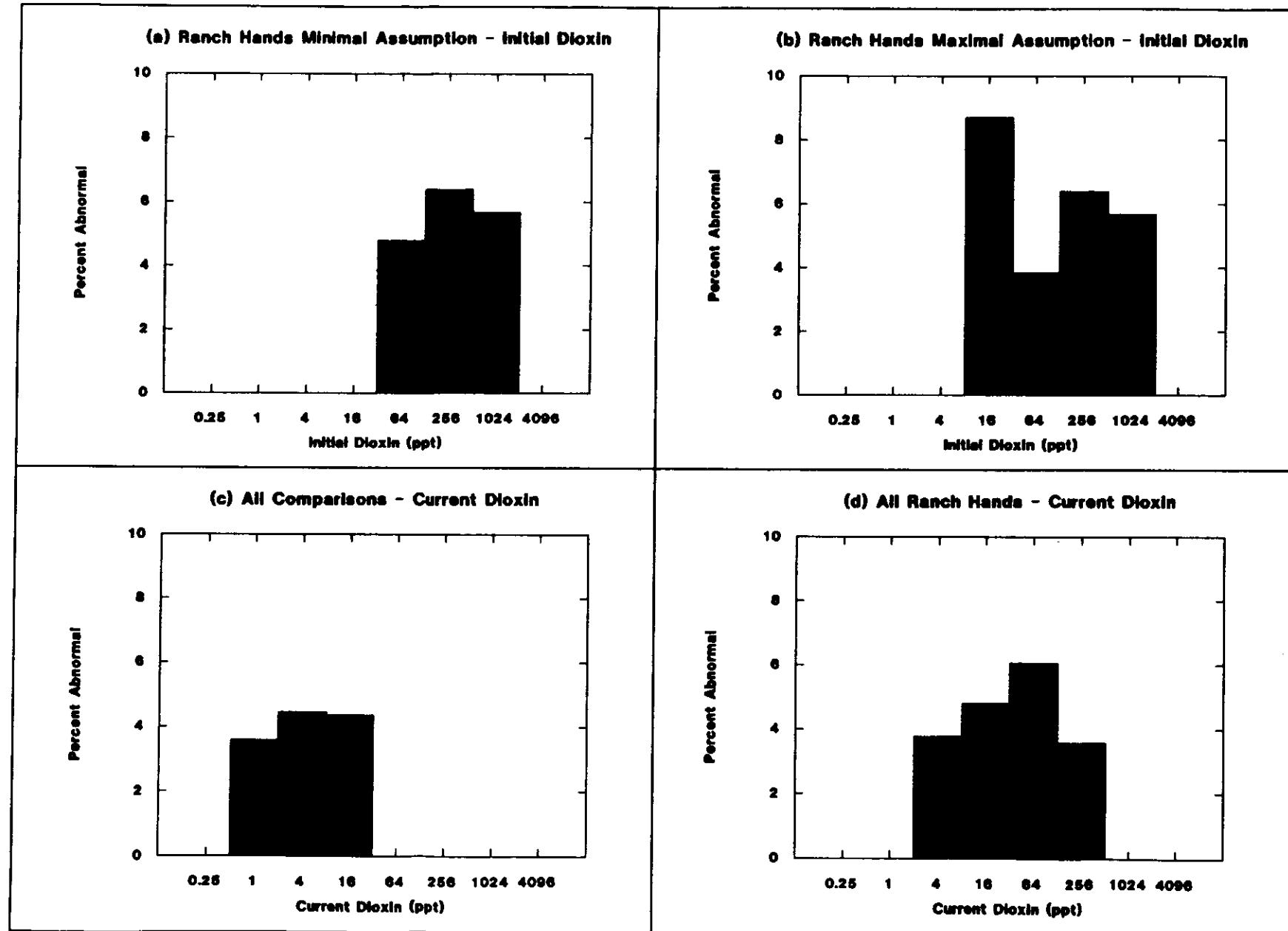


FIGURE K-1-15. Diastolic Blood Pressure (Discrete) versus Dioxin

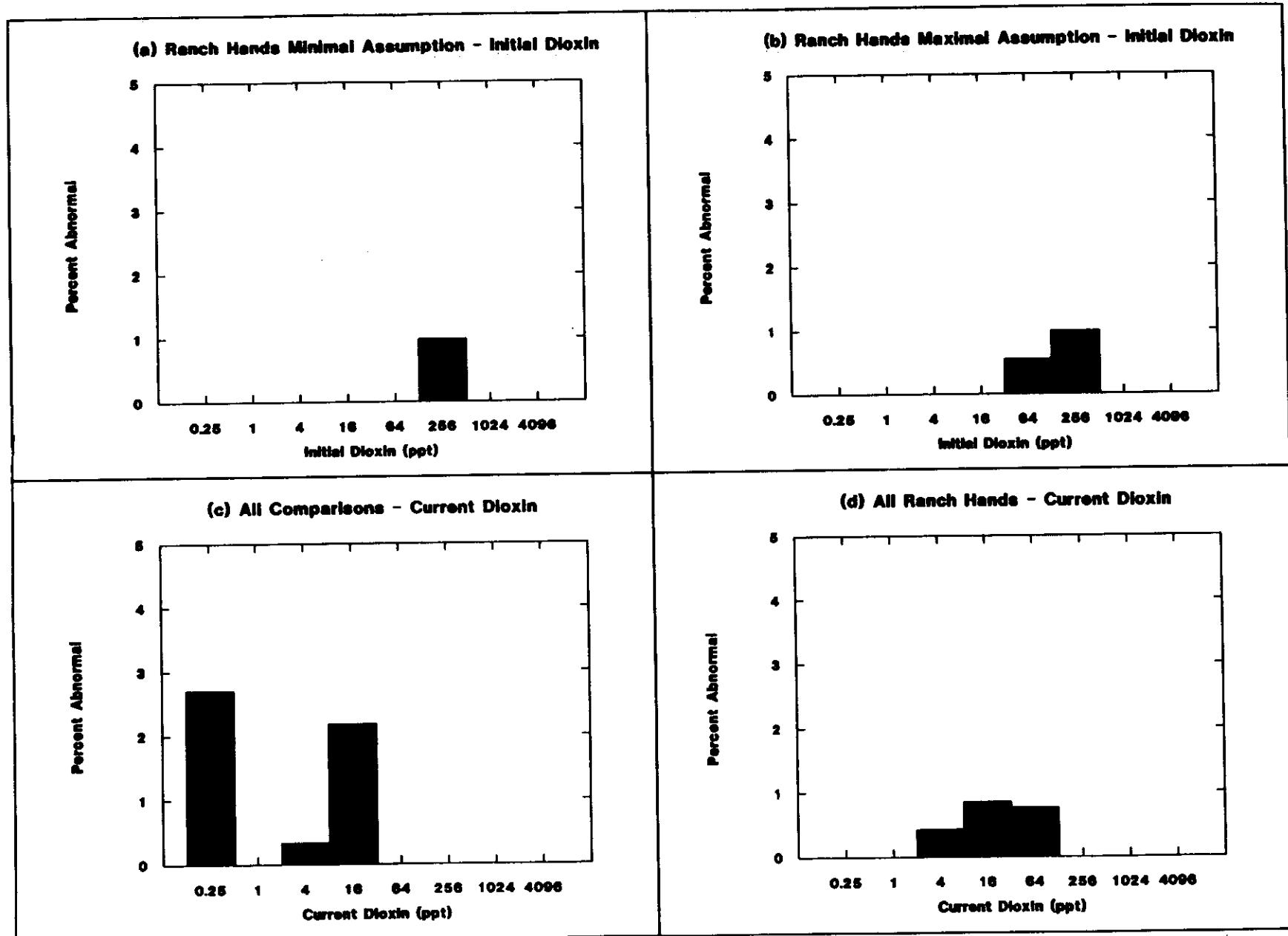


FIGURE K-1-16. Funduscopic Examination versus Dioxin

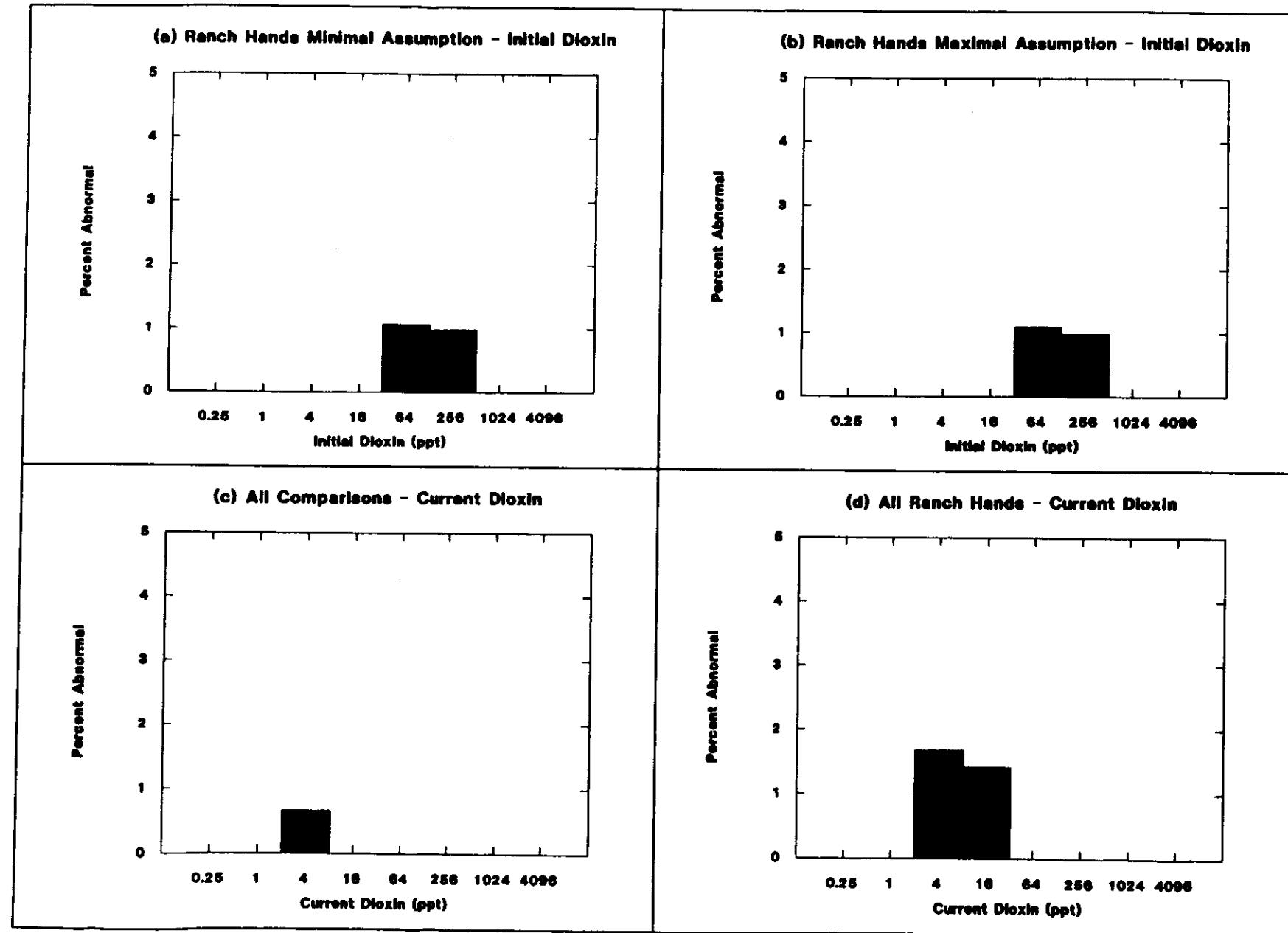


FIGURE K-1-17. Carotid Bruits versus Dioxin

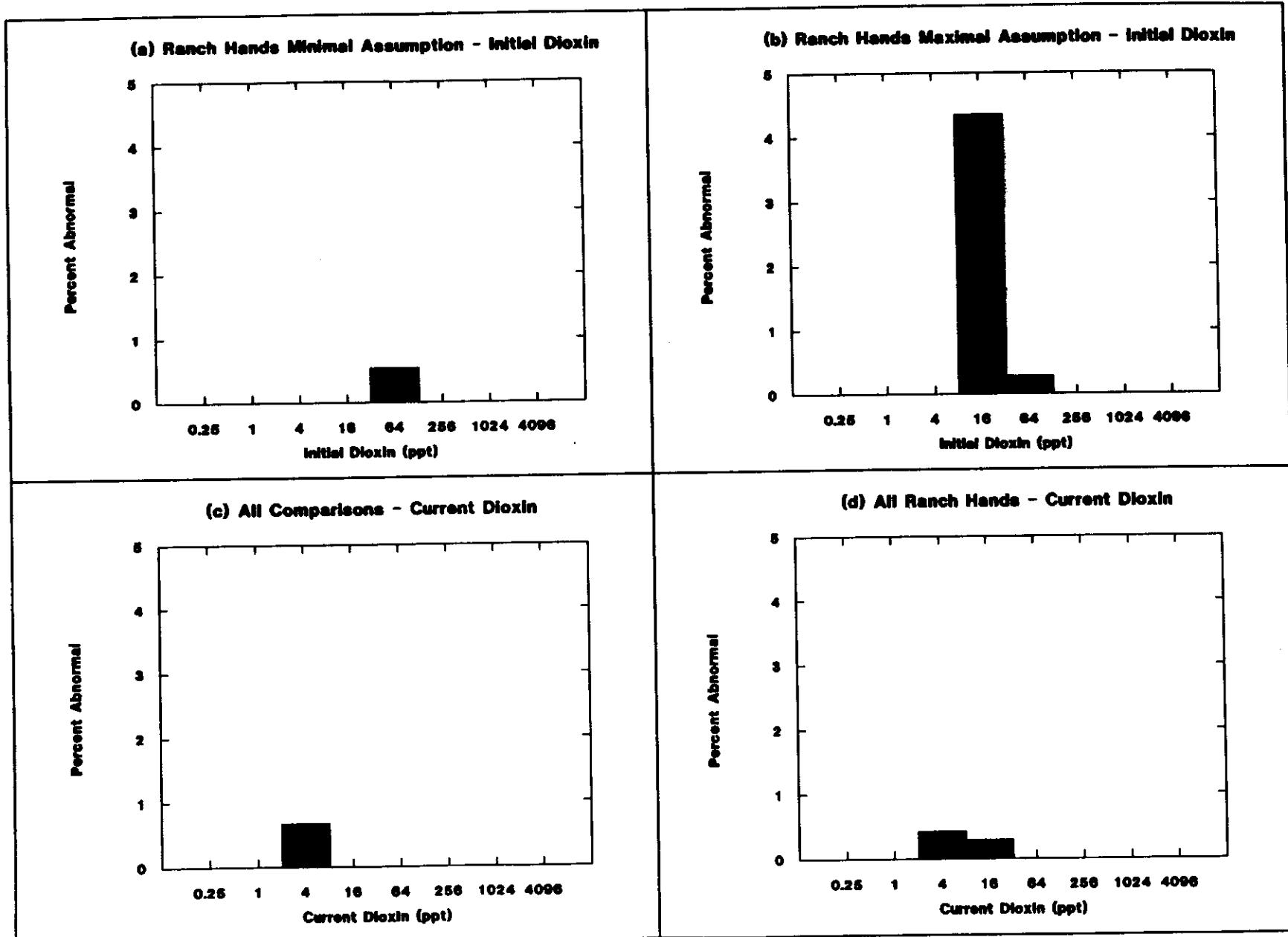


FIGURE K-1-18. Radial Pulses versus Dioxin

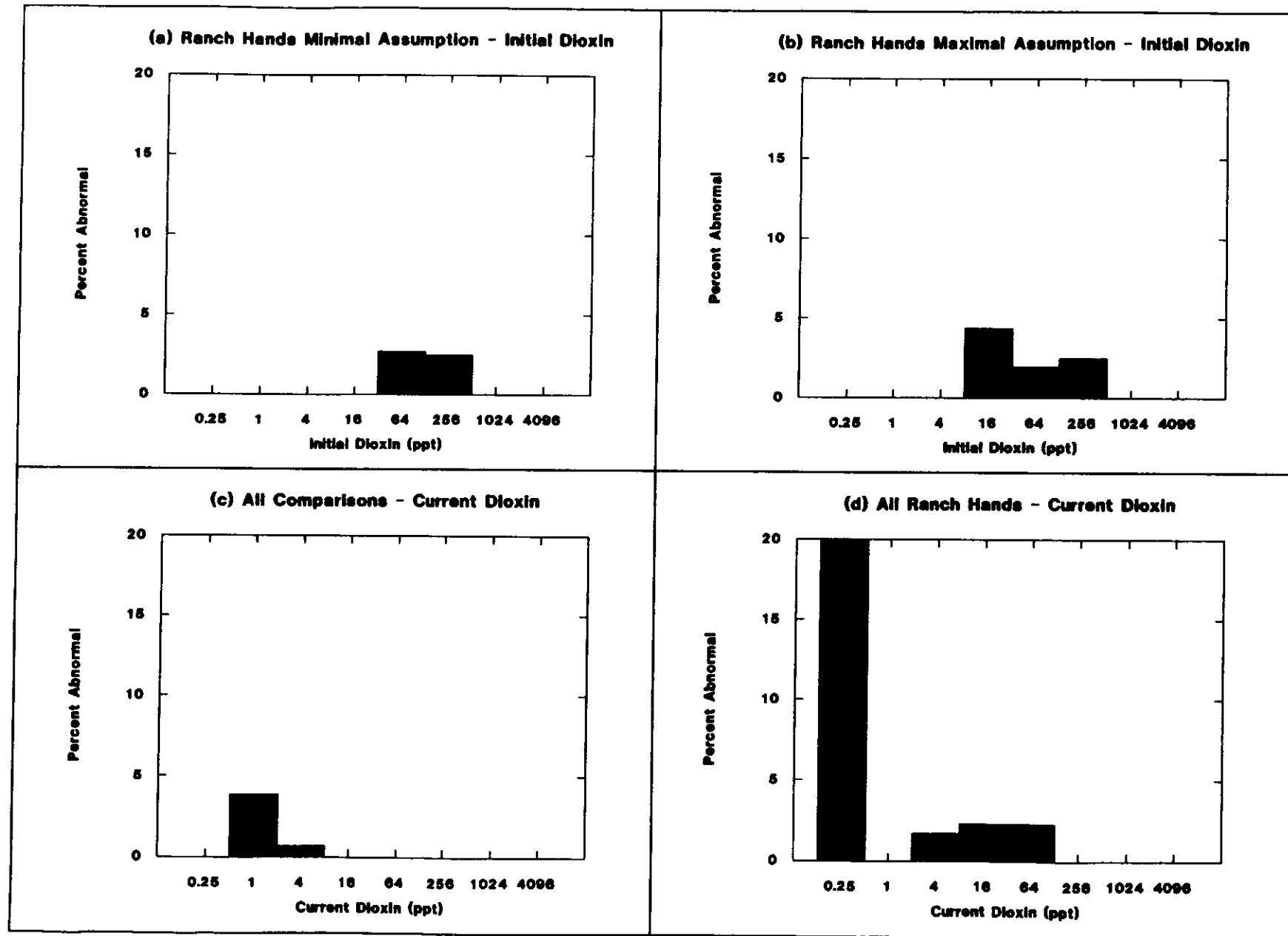


FIGURE K-1-19. Femoral Pulses versus Dioxin

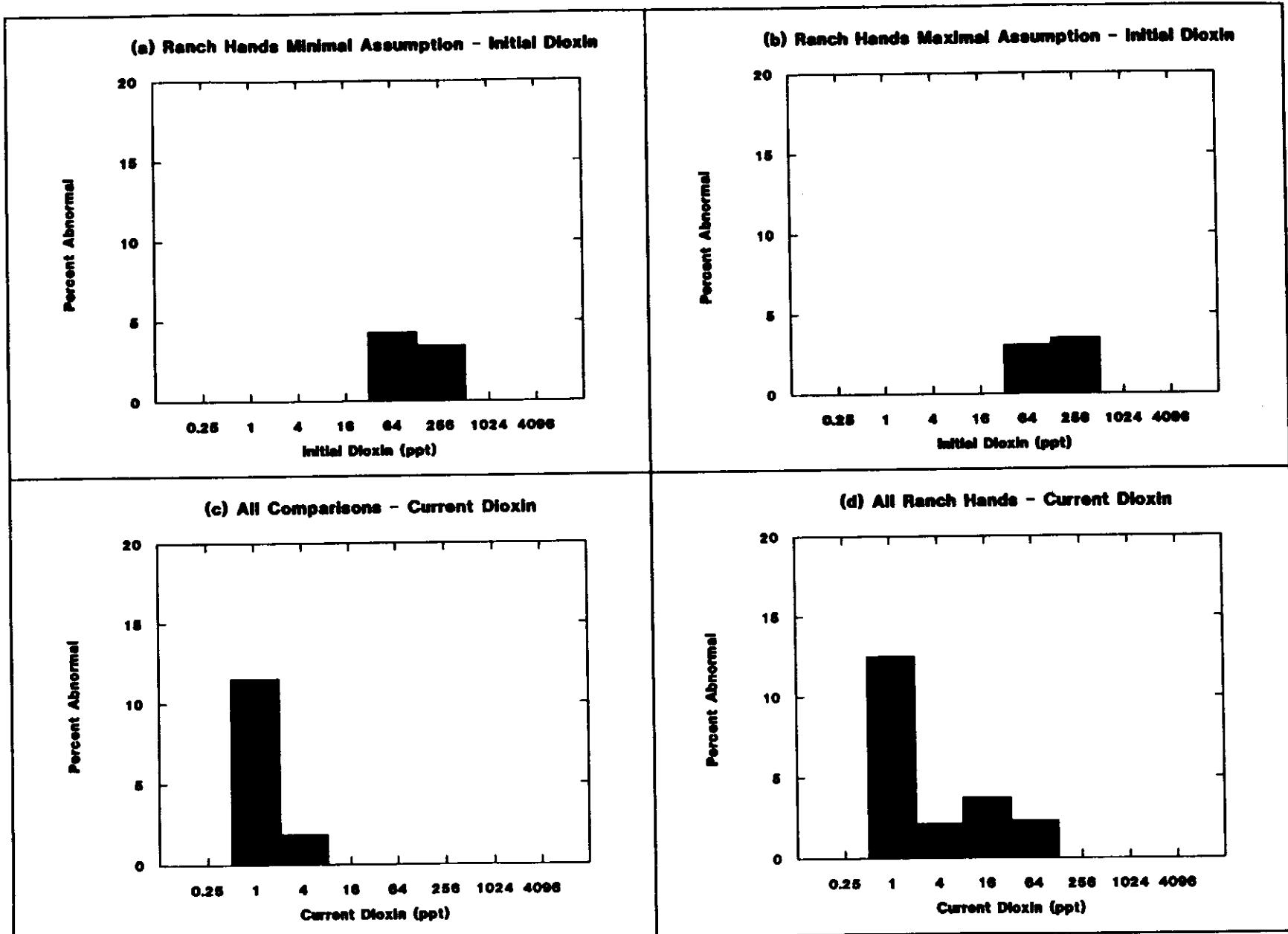


FIGURE K-1-20. Popliteal Pulses versus Dioxin

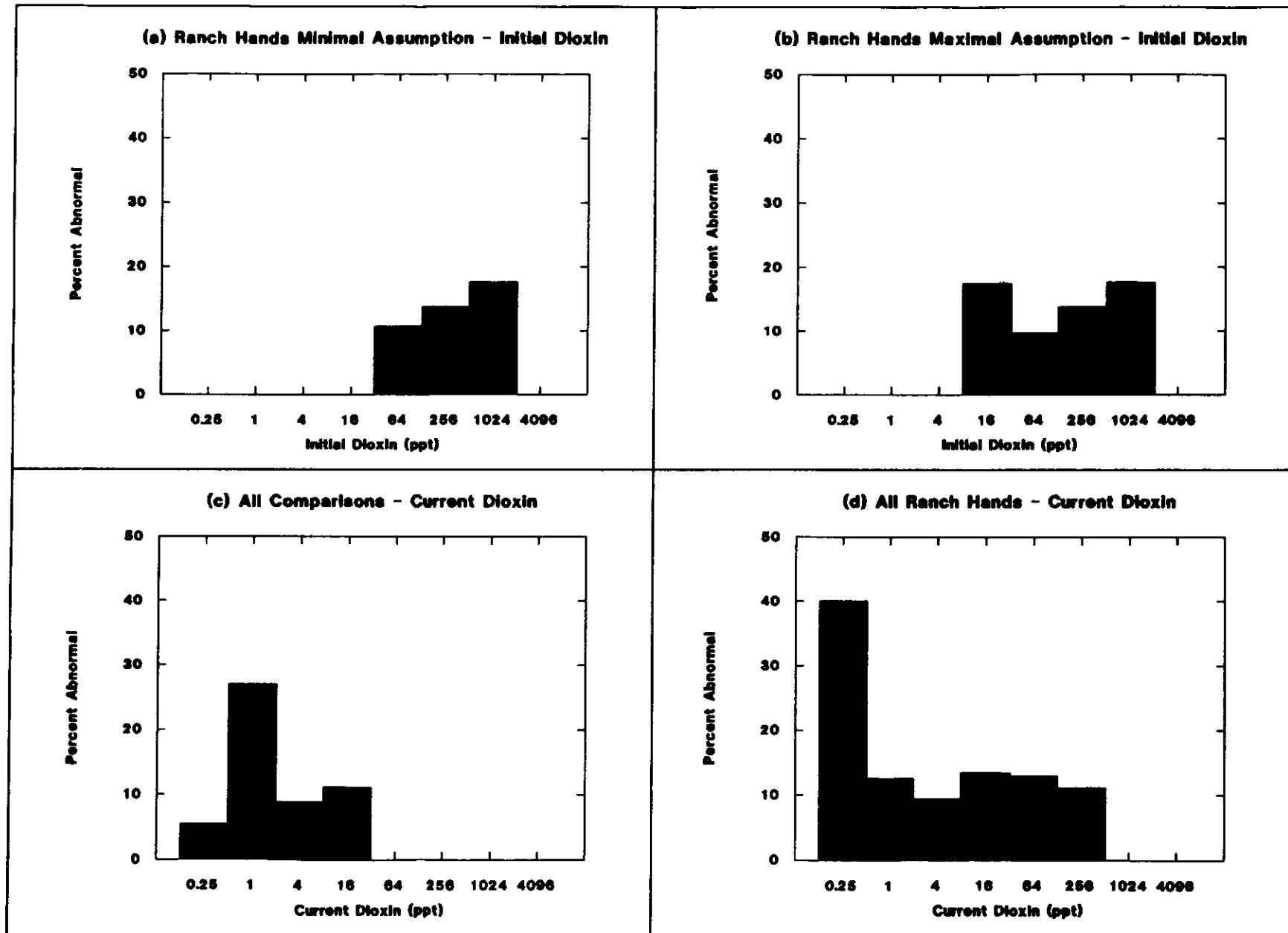


FIGURE K-1-21. Dorsalis Pedis Pulses versus Dioxin

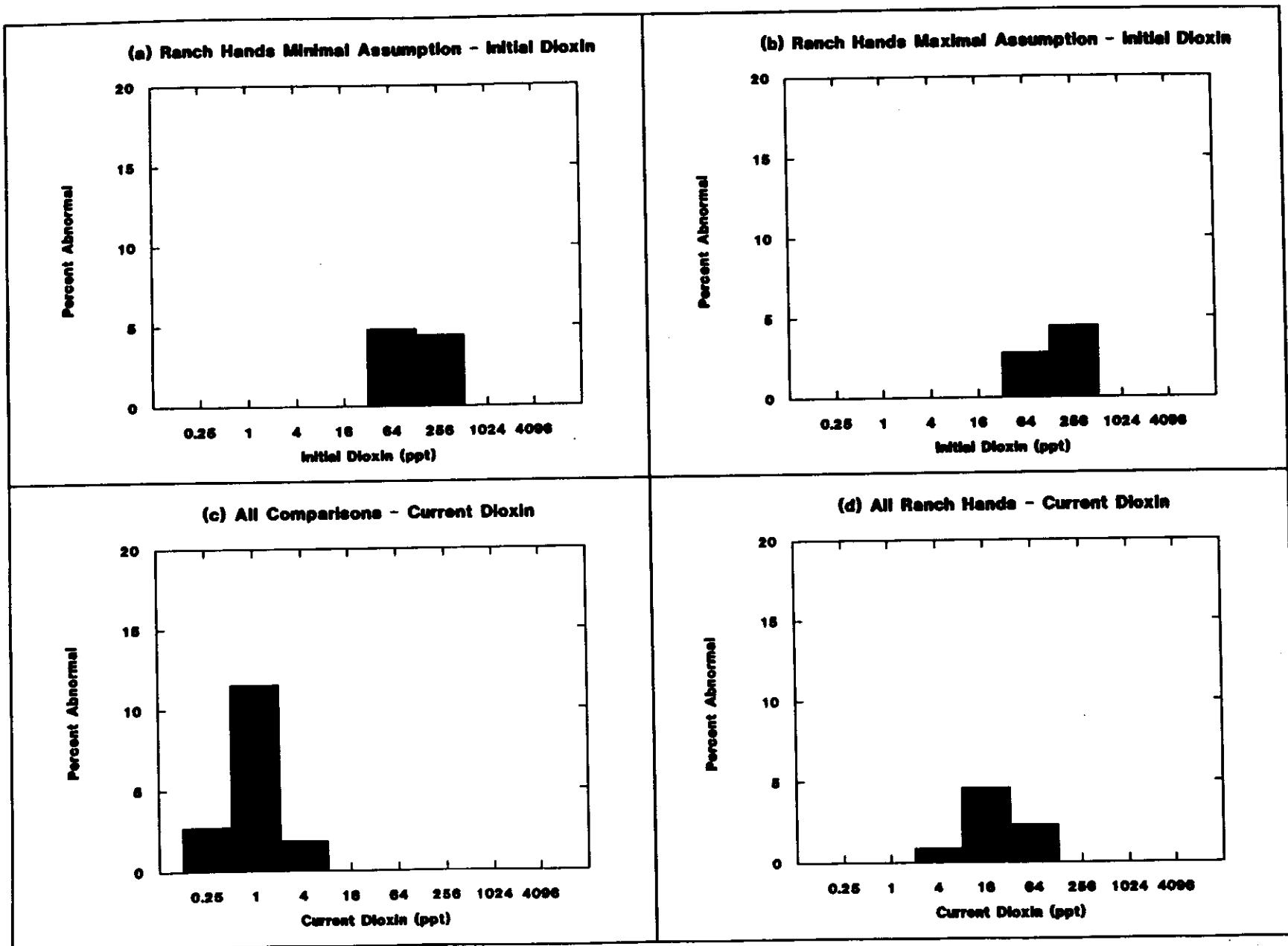


FIGURE K-1-22. Posterior Tibial Pulses versus Dioxin

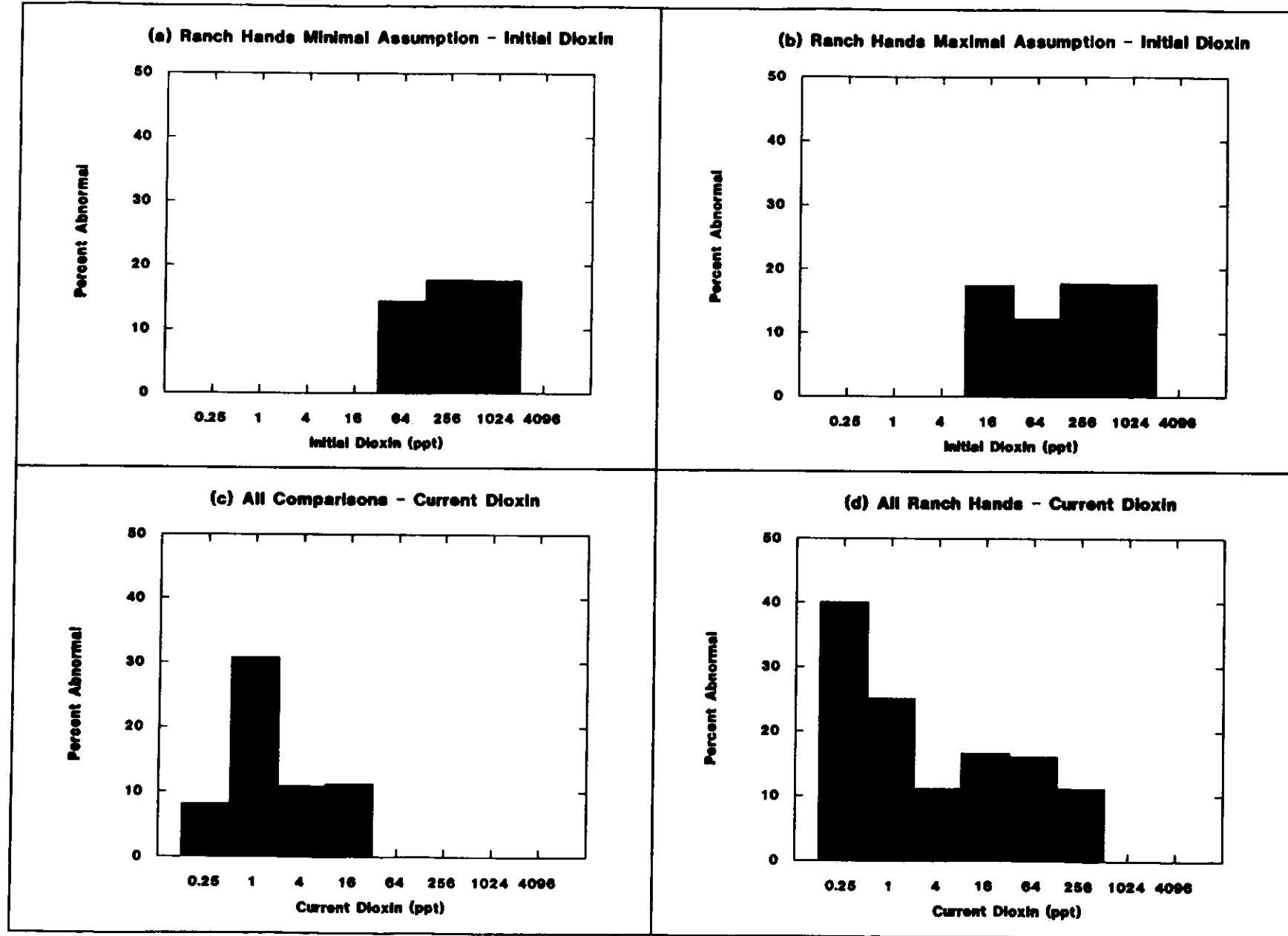


FIGURE K-1-23. Leg Pulses versus Dioxin

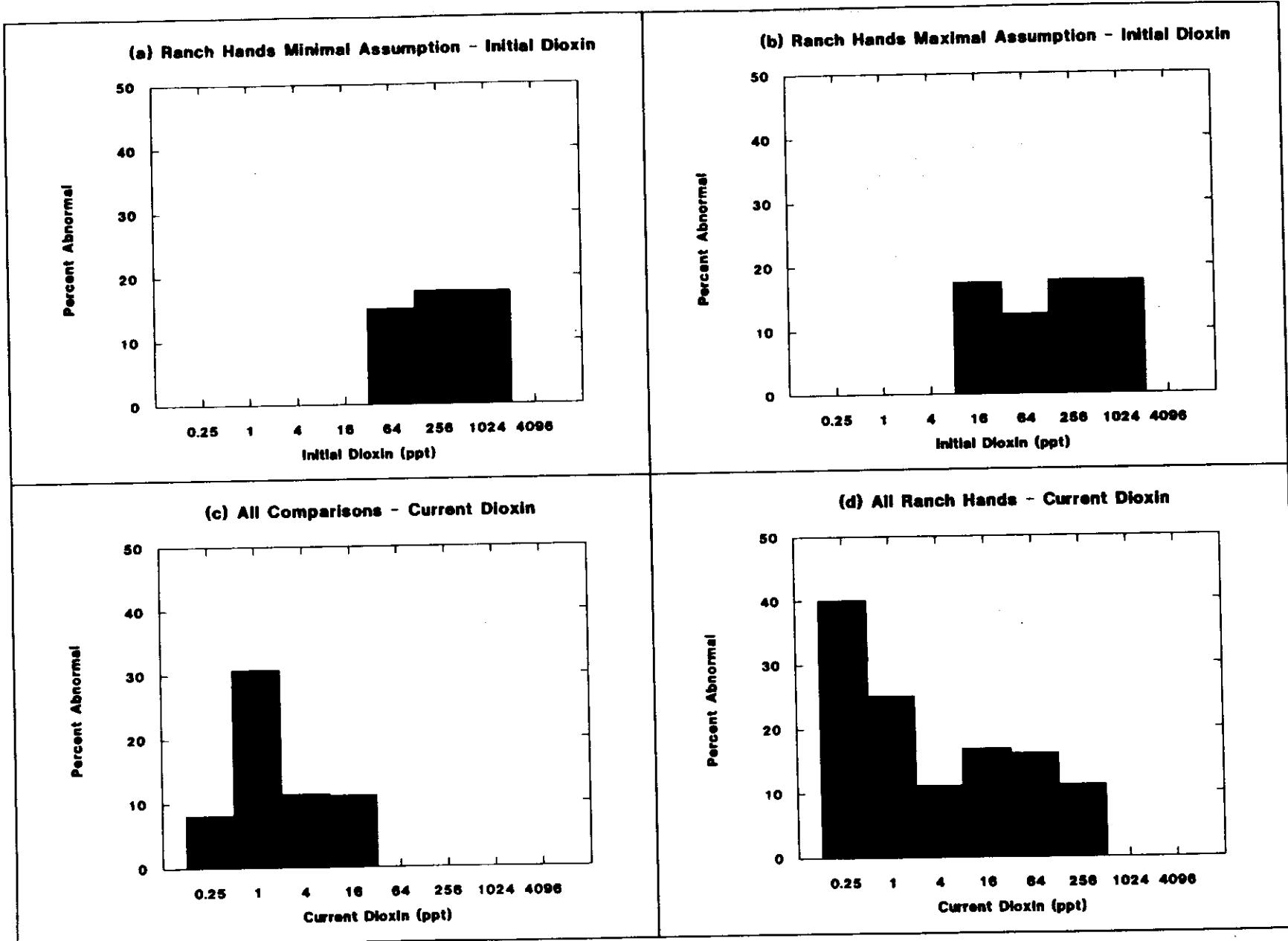


FIGURE K-1-24. Peripheral Pulses versus Dioxin

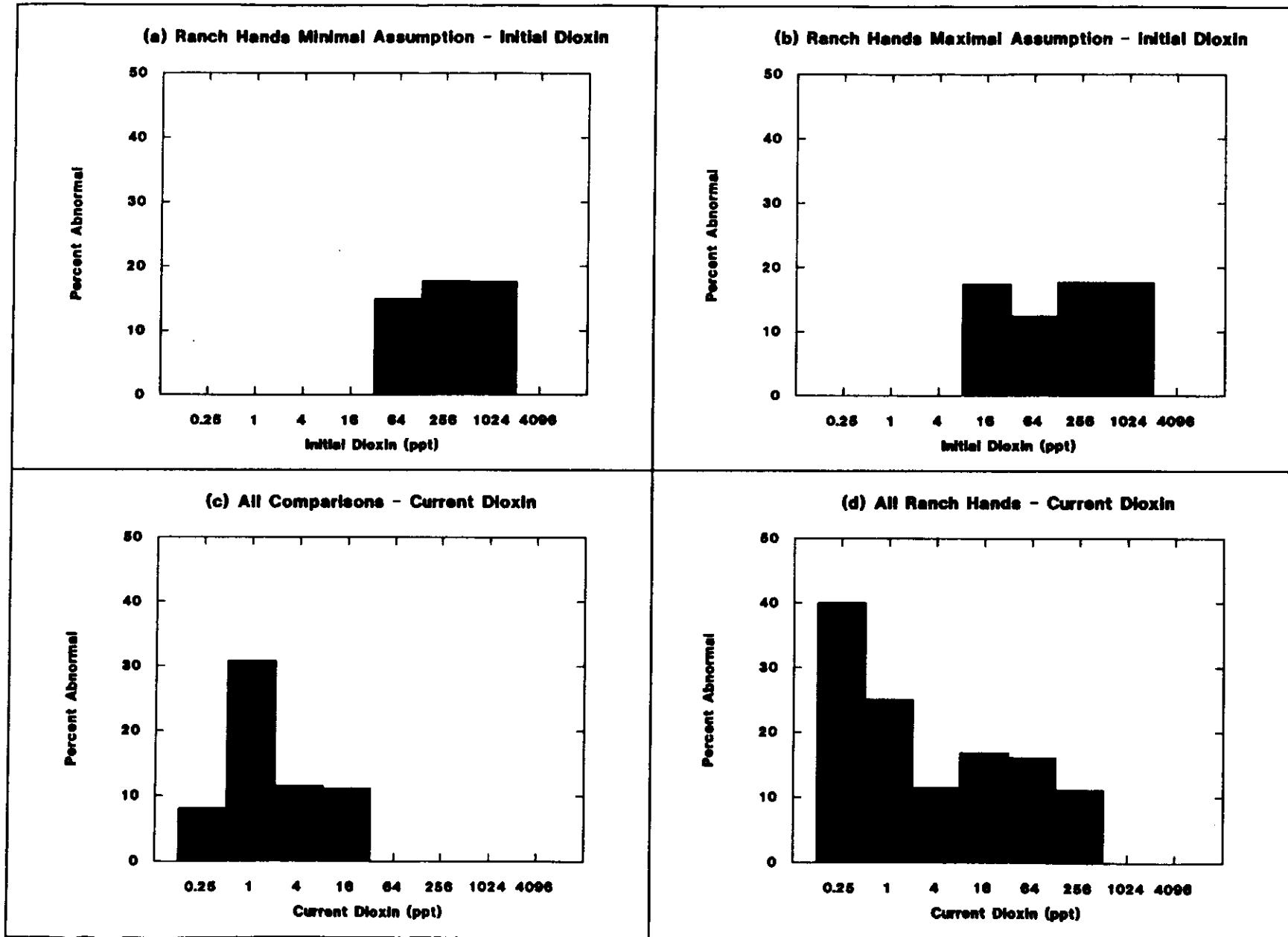


FIGURE K-1-25. All Pulses versus Dioxin

APPENDIX K-2.

Interaction Displays for the Cardiovascular Assessment

The following figures graphically display dioxin-by-covariate interactions found in the statistical analyses of the dependent variables in the cardiovascular assessment. For interactions with initial dioxin in the Ranch Hands involving continuous dependent variables, bivariate plots are presented with observations in each stratum represented by different symbols. Initial dioxin is shown in original units (ppt) but spacing of intervals is based on the logarithm (base 2) scale. The dependent variable is also displayed in original units but spacing is based on the scale used for analysis, as described in the chapter. The reference lines indicate the general relationship, unadjusted for any covariates, between the (transform of the) dependent variable and \log_2 (initial dioxin). For each stratum, the lines span the range of initial dioxin. For interactions with initial dioxin in the Ranch Hands involving discrete variables, the stratum-specific percentage of participants that exhibited an abnormal condition is displayed for low, medium, and high initial dioxin categories (as defined in Appendix K, Table K-1), and each stratum is represented by a different design. Appendix Table K-1 also displays the sample sizes for each bar on the graph.

In the Ranch Hands, for current dioxin-by-time-by-covariate interactions with continuous dependent variables, separate bivariate plots (dependent variable versus current dioxin) are presented for each stratum of the covariate. Different symbols represent late tours (time since tour ≤ 18.6 years) and early tours (time since tour > 18.6 years) within each plot. The spacing for current dioxin and the dependent variable follows the same conventions as described above, as do the reference lines. For current dioxin-by-time-by-covariate interactions in the Ranch Hands with discrete dependent variables, a stratum-specific percentage of participants that exhibited an abnormal condition is displayed for low, medium, and high current dioxin. Different designs represent separate time since tour categories, and covariate strata are given on separate panels. Appendix Table K-1 provides the sample sizes for each bar on the graph.

For covariate interactions with current dioxin categorized within the Ranch Hand and Comparison groups involving continuous dependent variables, adjusted means for the background category in the Comparisons, and the unknown, low, and high categories in the Ranch Hands, are shown. Appendix Table K-1 presents the definition of these categories and the sample sizes for each mean. Different symbols distinguish the covariate categories and solid line segments connect the means to display a profile of the adjusted means. For covariate interactions with current dioxin categorized within the Ranch Hand and Comparison groups involving discrete dependent variables, bars representing the percentage of participants that exhibited an abnormal condition are displayed for each of the four current dioxin exposure categories. Different designs represent covariate categories.

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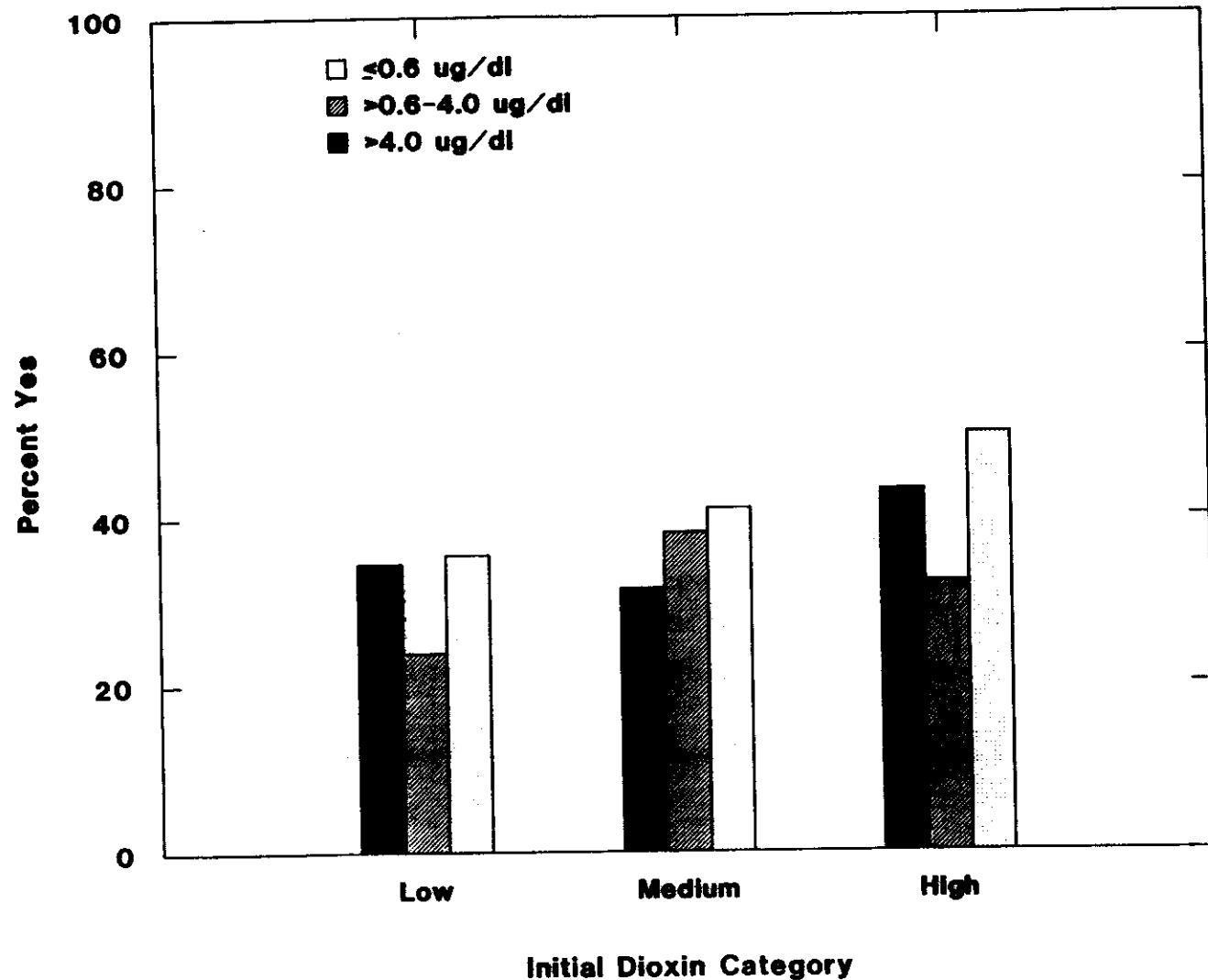


FIGURE K-2-1. Interaction of Initial Dioxin and Differential Cortisol Response for Reported/Verified Essential Hypertension (Ranch Hands, Maximal Assumption)

K-2-5

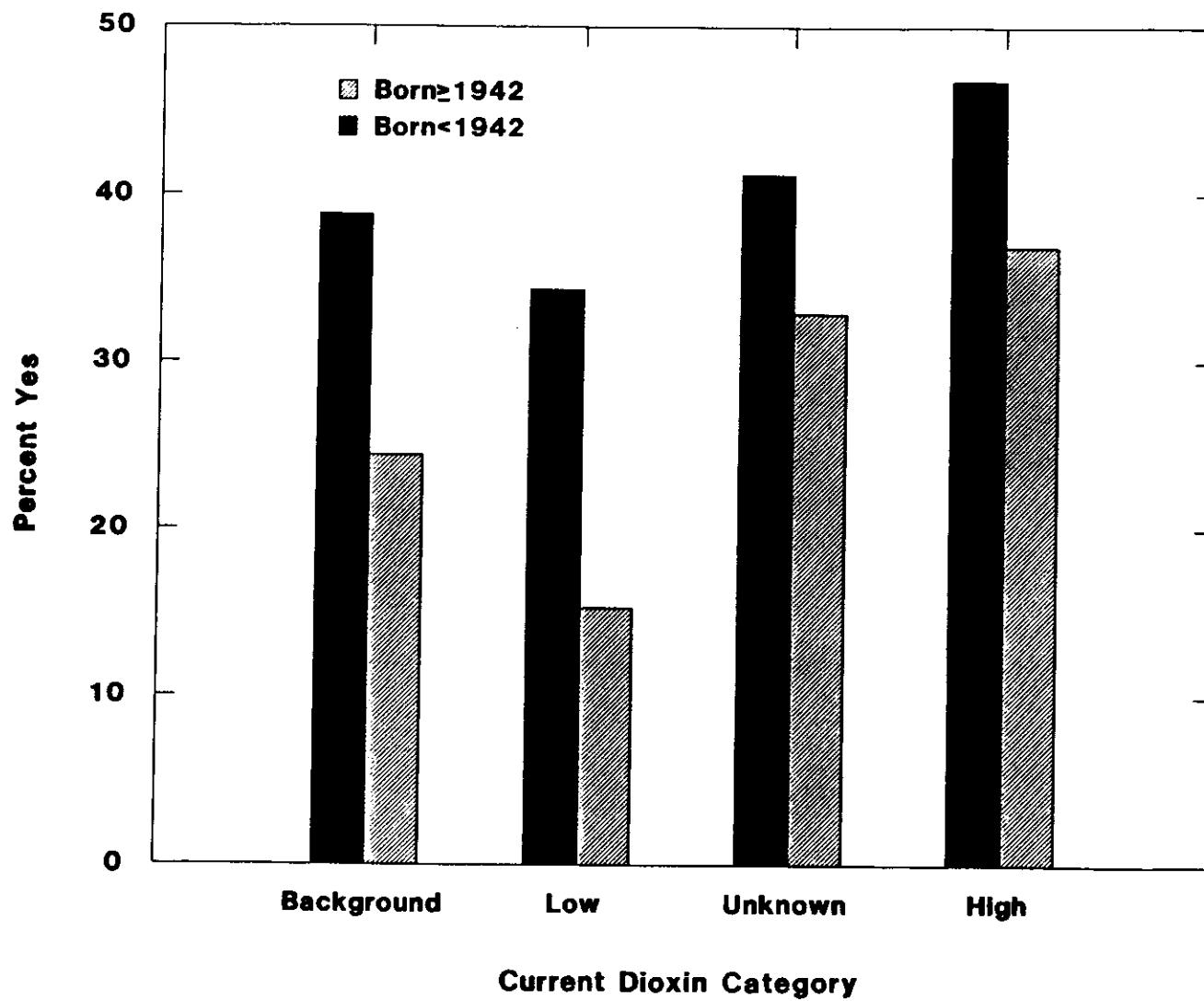


FIGURE K-2-2. Interaction of Categorized Current Dioxin and Age for Reported/Verified Essential Hypertension

K-2-6

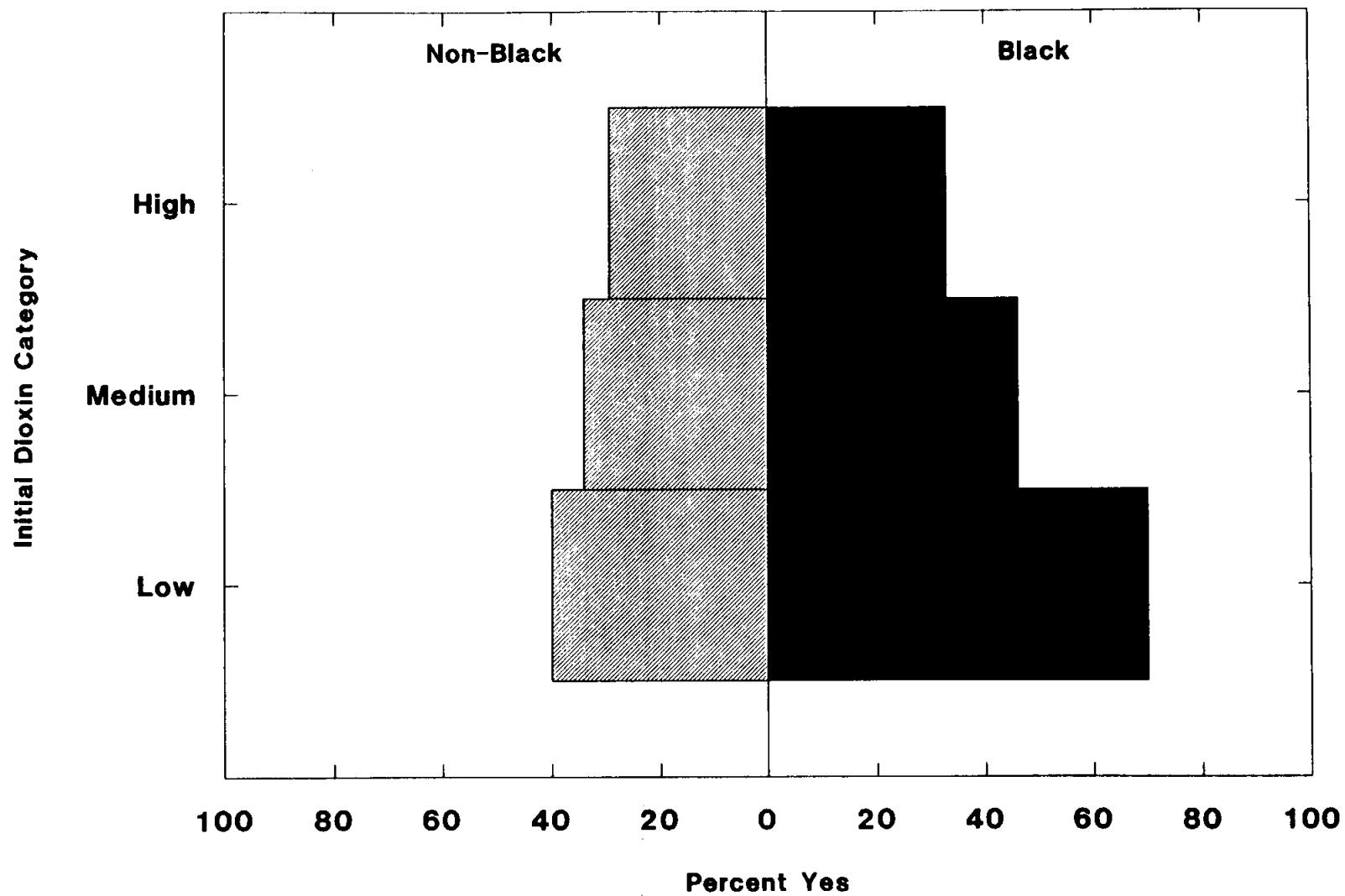


FIGURE K-2-3. Interaction of Initial Dioxin and Race for Reported Heart Disease (Excluding Essential Hypertension) (Ranch Hands, Minimal Assumption)

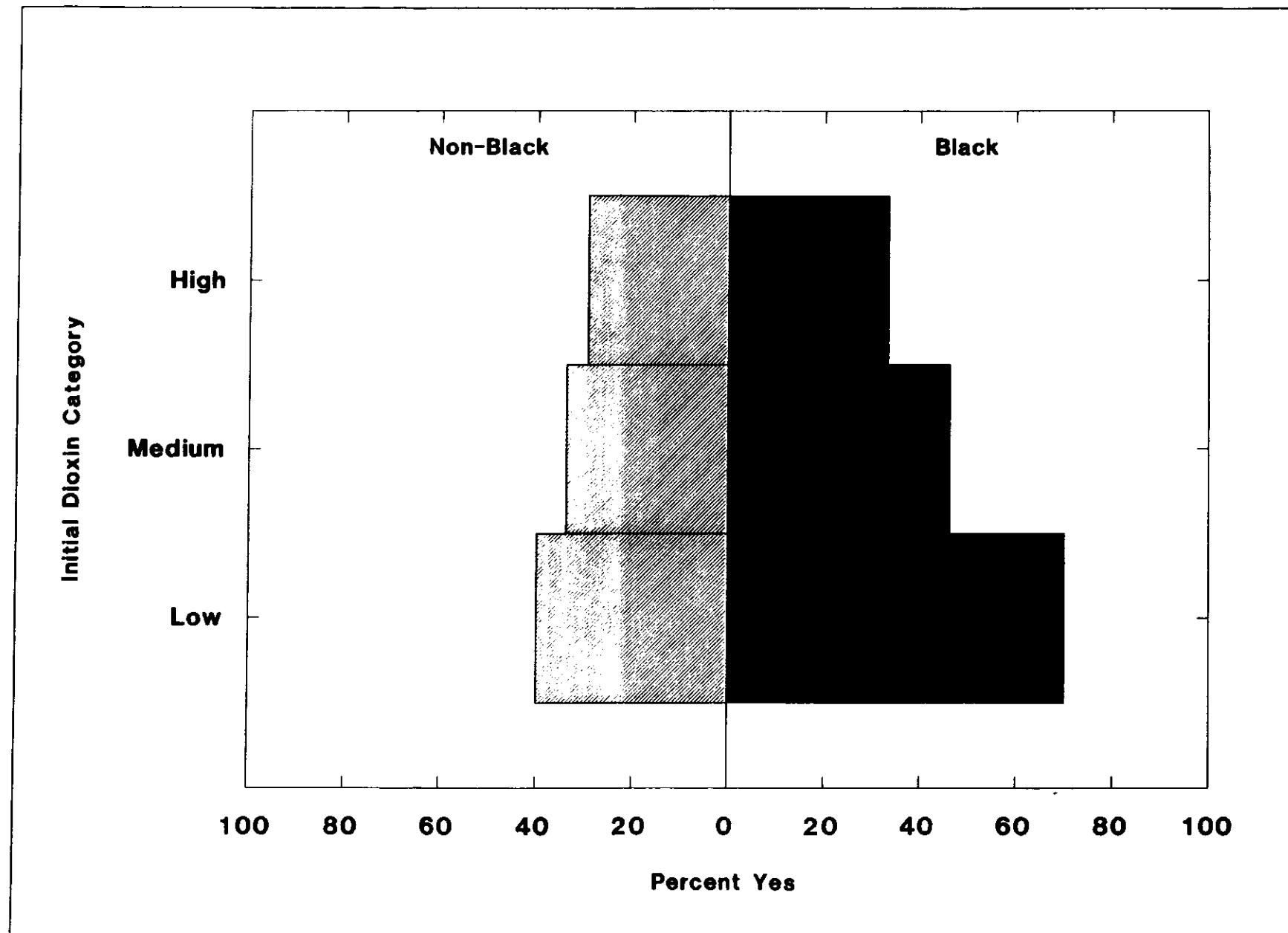


FIGURE K-2-4. Interaction of Initial Dioxin and Race for Verified Heart Disease (Excluding Essential Hypertension) (Ranch Hands, Minimal Assumption)

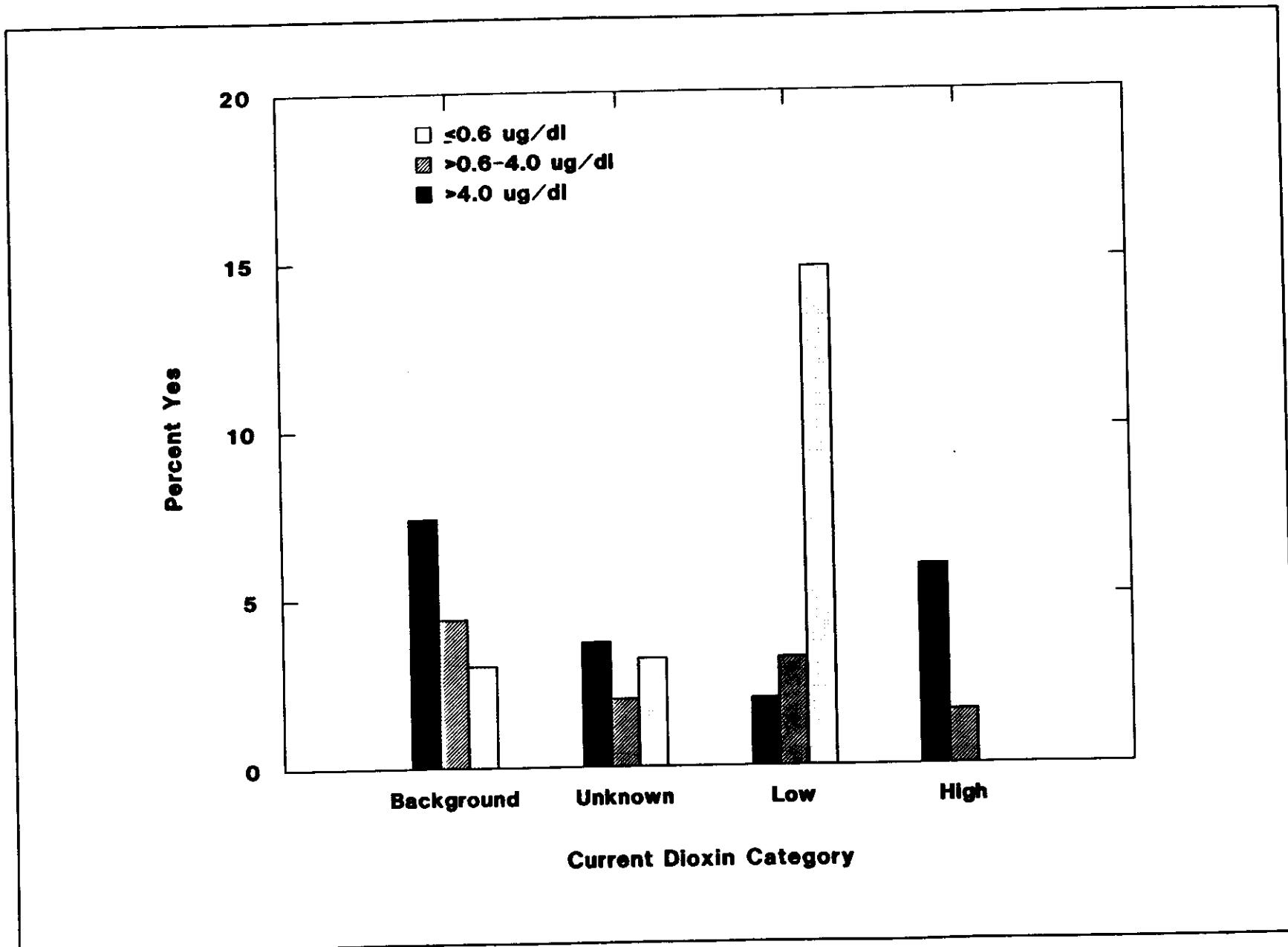


FIGURE K-2-5. Interaction of Categorized Current Dioxin and Differential Cortisol Response for Reported/Verified Myocardial Infarction

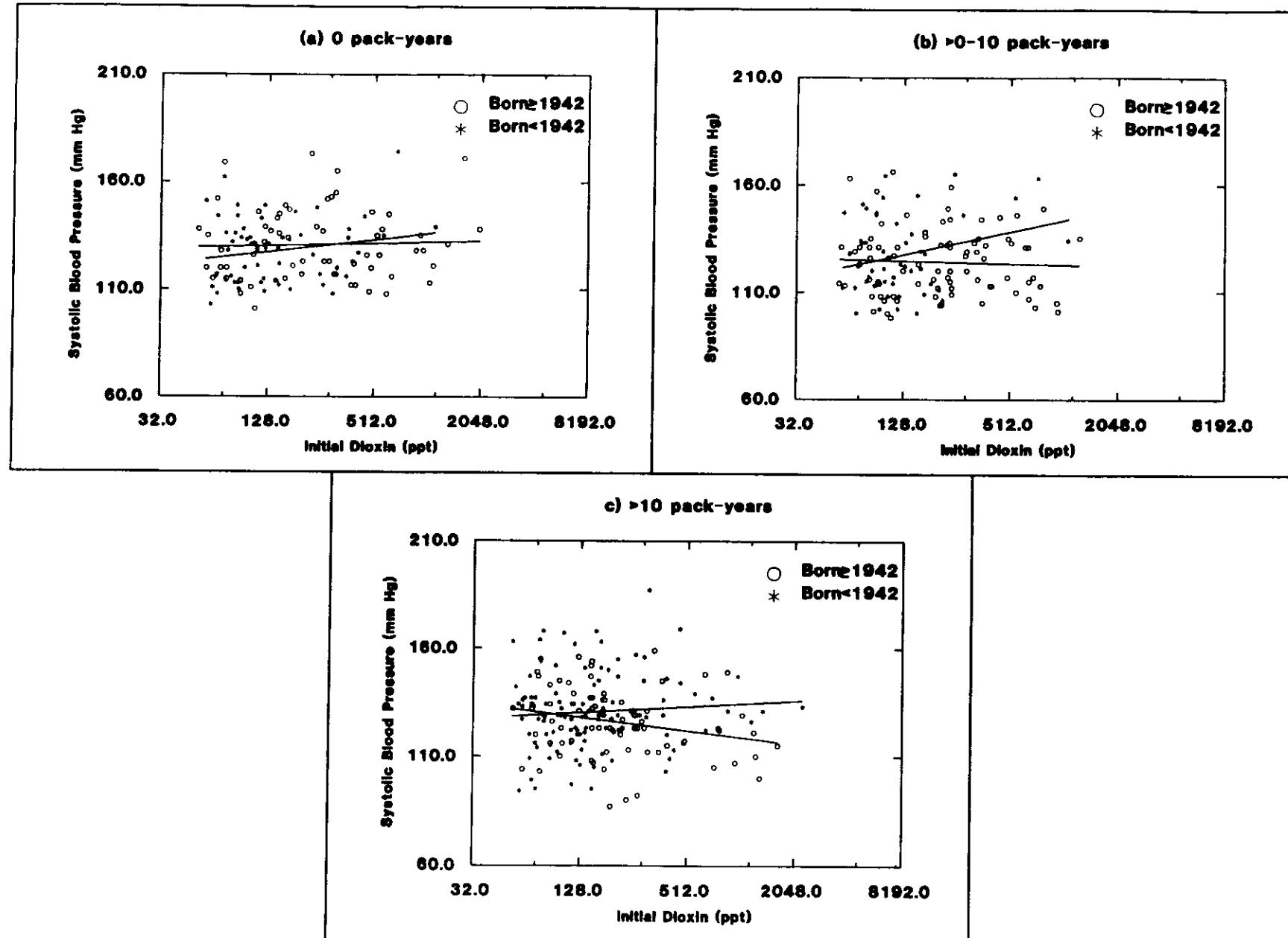


FIGURE K-2-6. Interaction of Initial Dioxin, Age, and Lifetime Cigarette Smoking History for Systolic Blood Pressure (Continuous - Ranch Hands, Minimal Assumption)

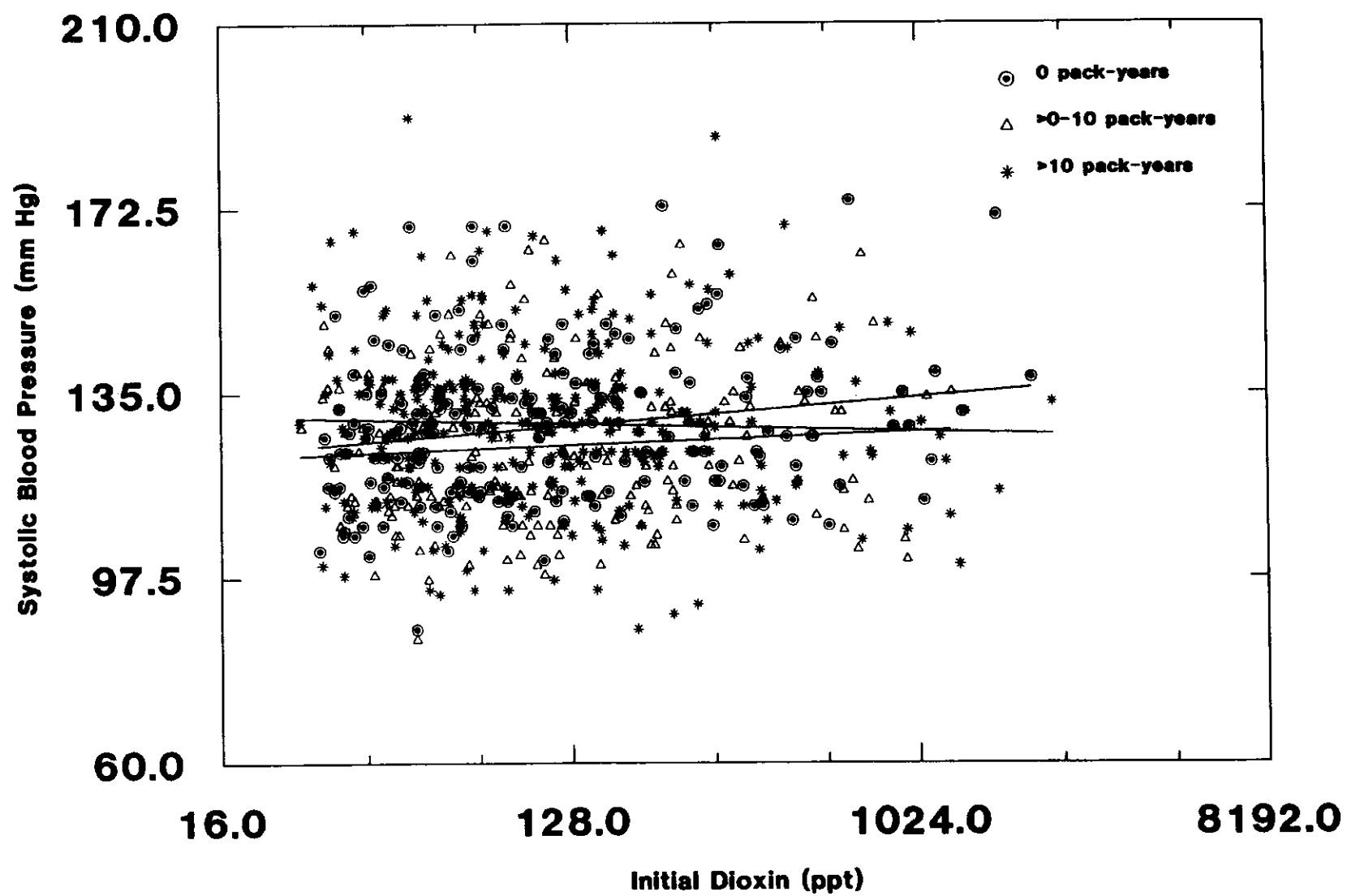


FIGURE K-2-7. Interaction of Initial Dioxin and Lifetime Cigarette Smoking History for Systolic Blood Pressure (Continuous - Ranch Hands, Maximal Assumption)

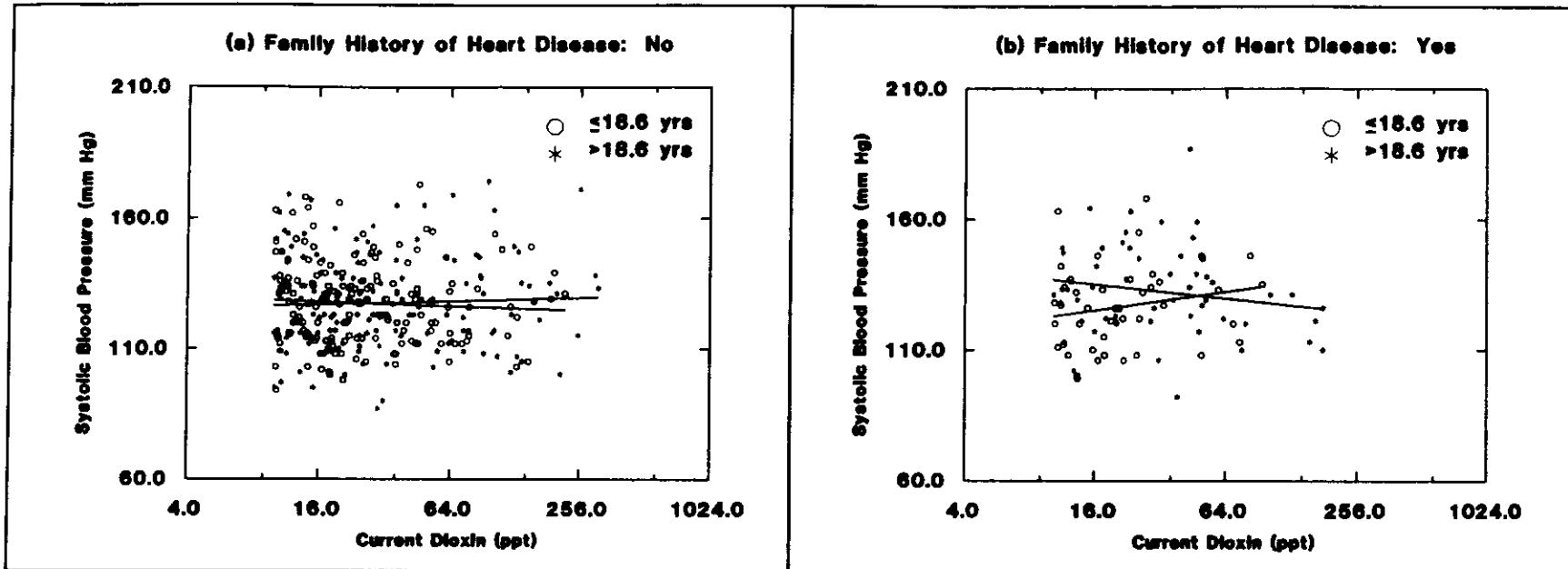


FIGURE K-2-8. Interaction of Current Dioxin, Time, and Family History of Heart Disease for Systolic Blood Pressure (Continuous - Ranch Hands, Minimal Assumption)

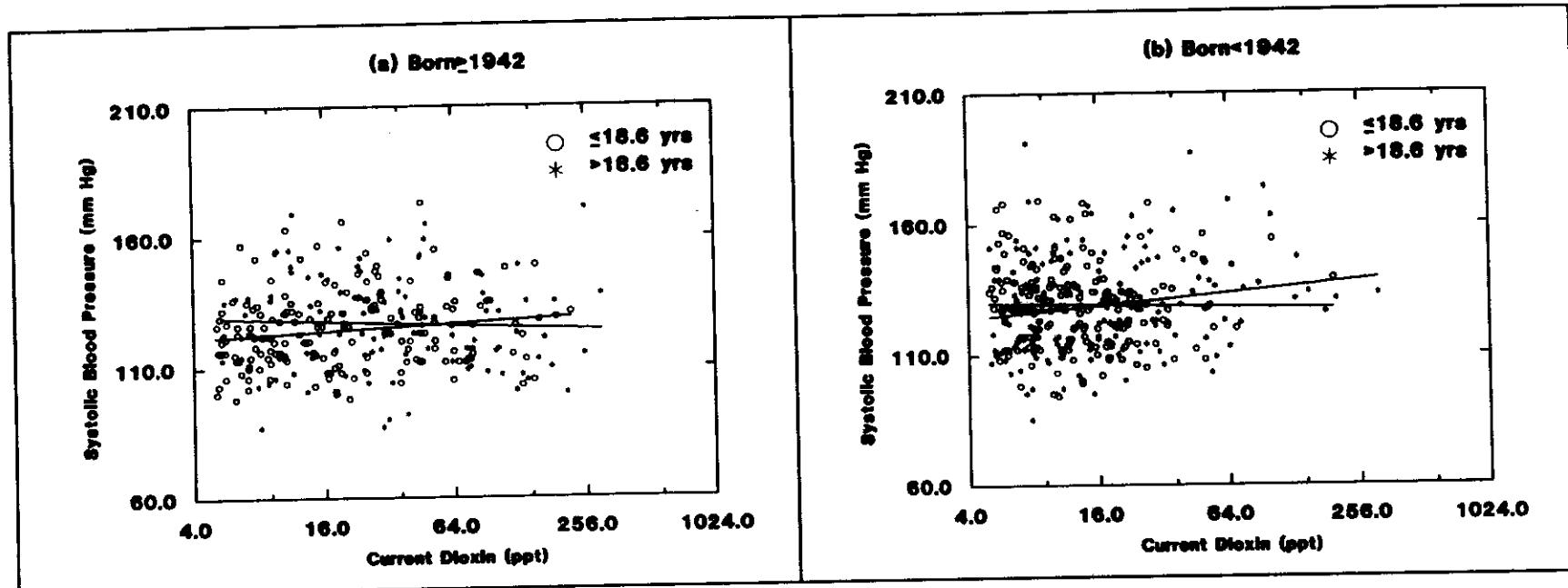


FIGURE K-2-9. Interaction of Current Dioxin, Time, and Age for Systolic Blood Pressure (Continuous - Ranch Hands, Maximal Assumption)

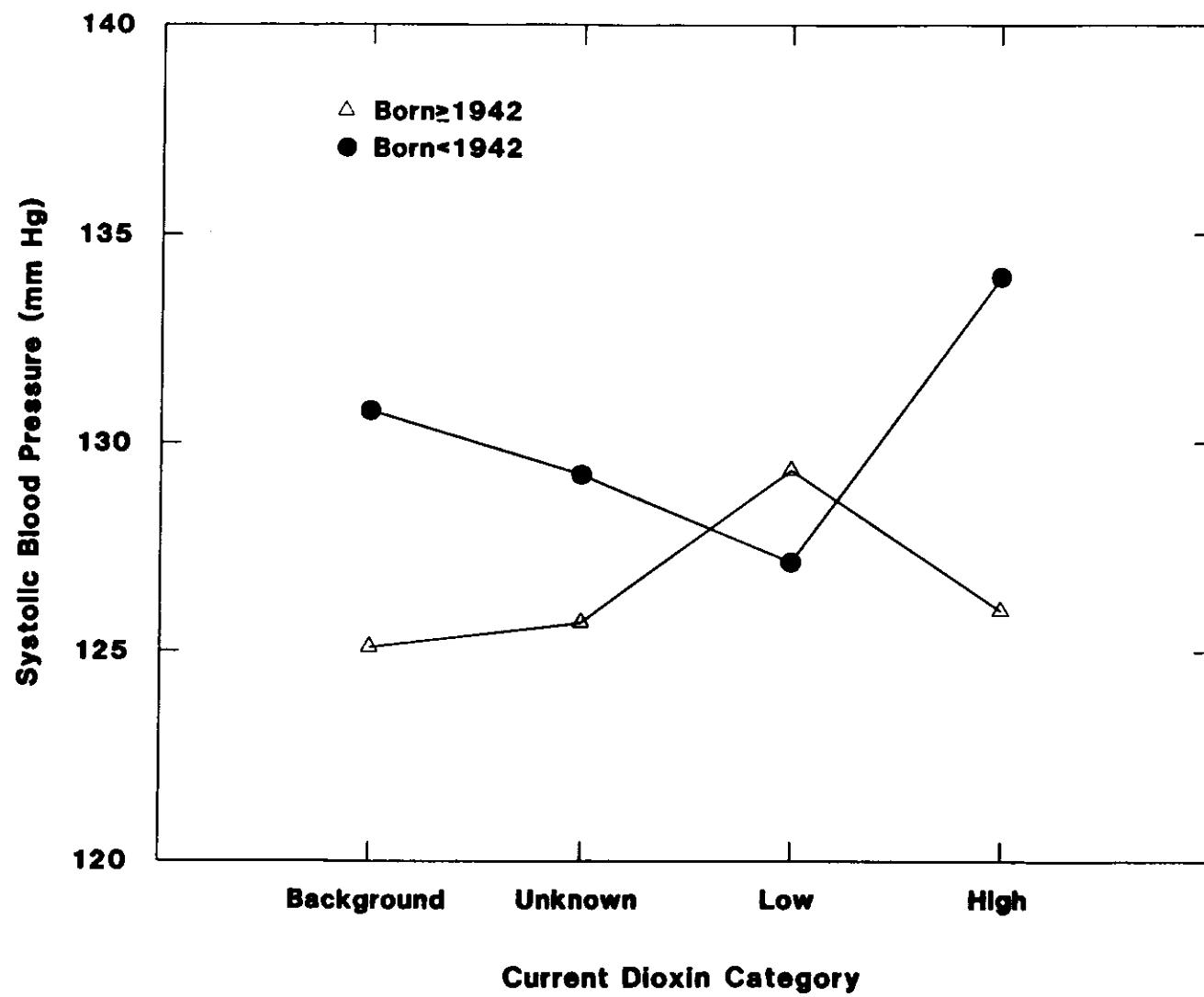


FIGURE K-2-10. Interaction of Categorized Current Dioxin and Age for Systolic Blood Pressure (Continuous)

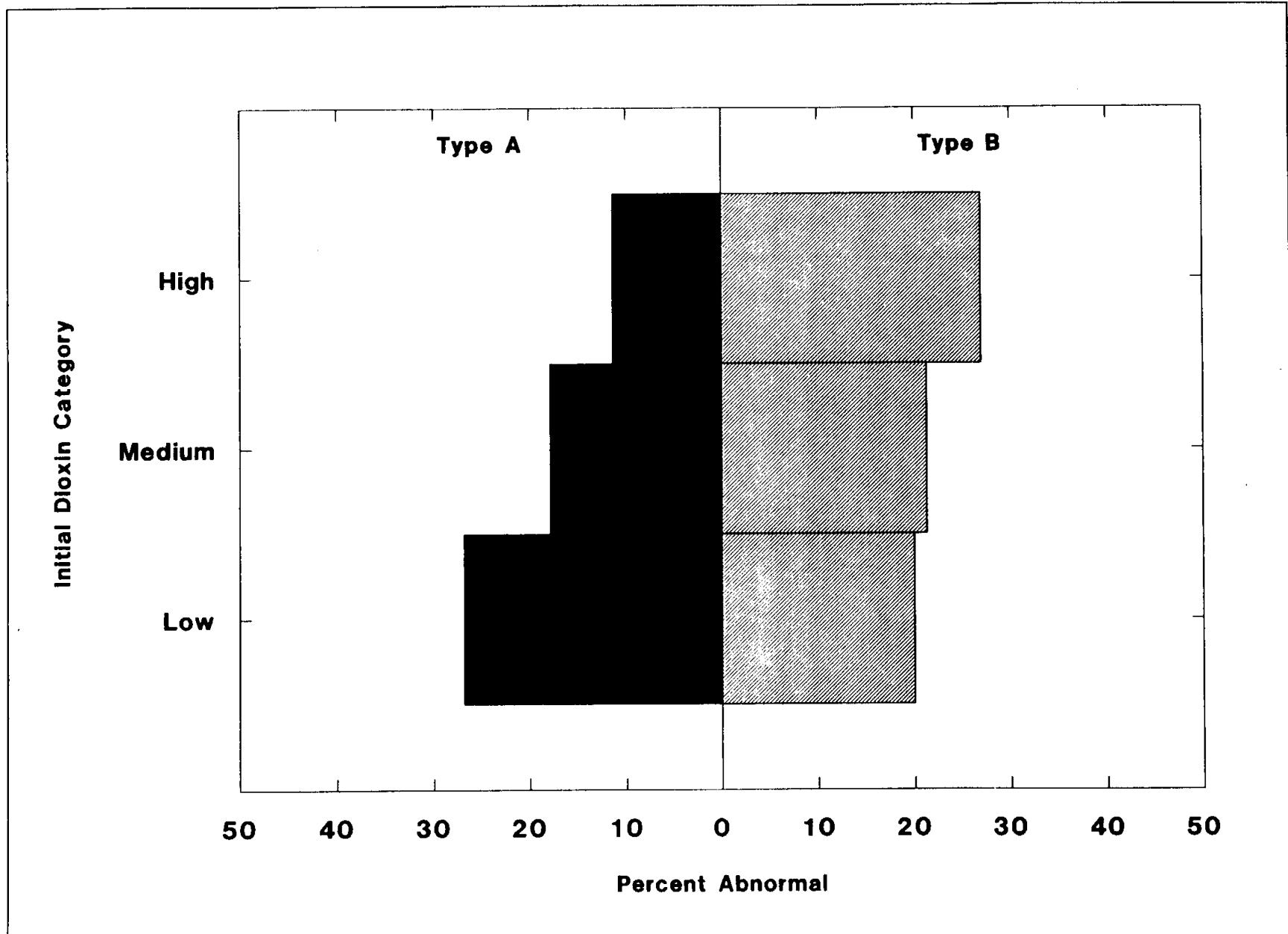


FIGURE K-2-11. Interaction of Initial Dioxin and Personality Type for Systolic Blood Pressure (Discrete – Ranch Hands, Minimal Assumption)

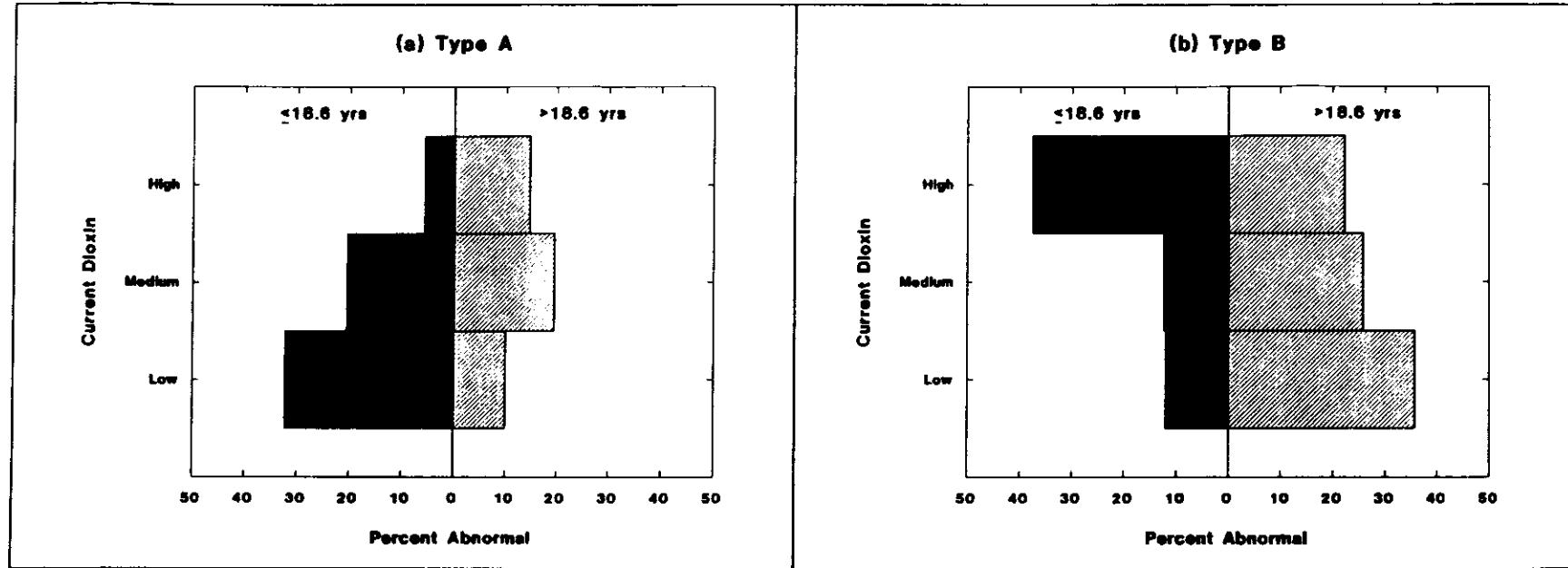


FIGURE K-2-12. Interaction of Current Dioxin, Time, and Personality Type for Systolic Blood Pressure (Discrete - Ranch Hands, Minimal Assumption)

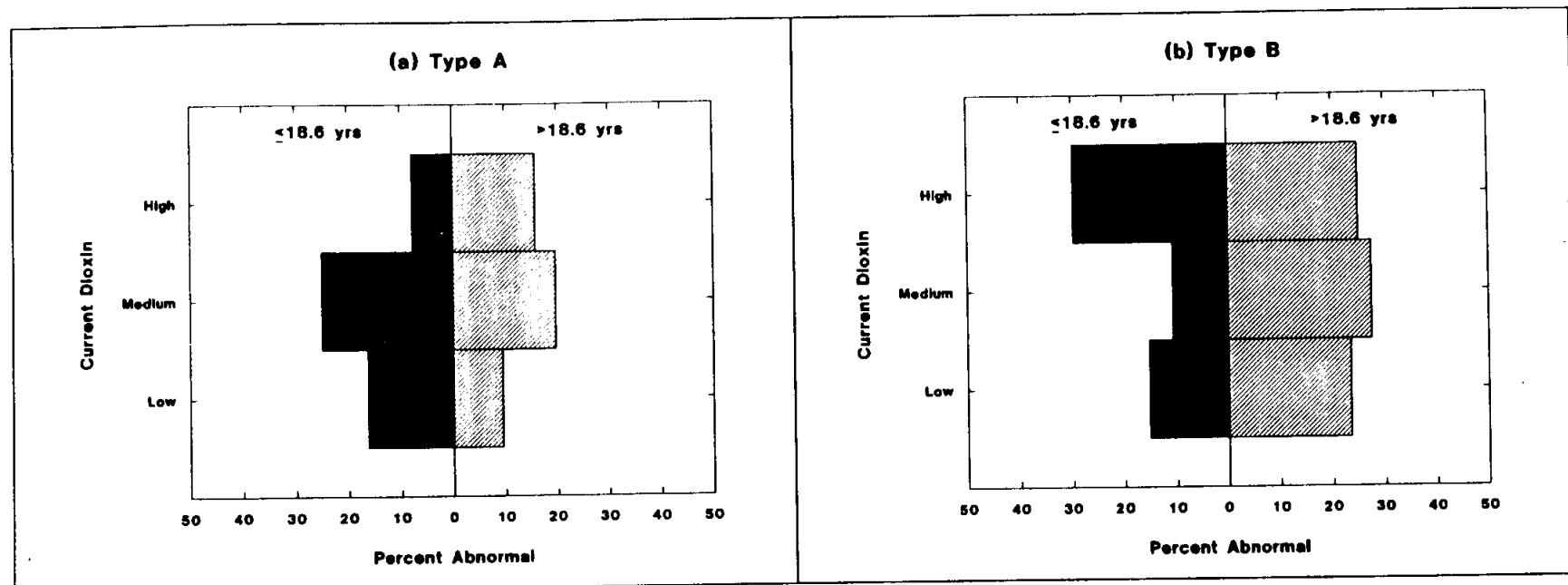


FIGURE K-2-13. Interaction of Current Dioxin, Time, and Personality Type for Systolic Blood Pressure (Discrete - Ranch Hands, Maximal Assumption)

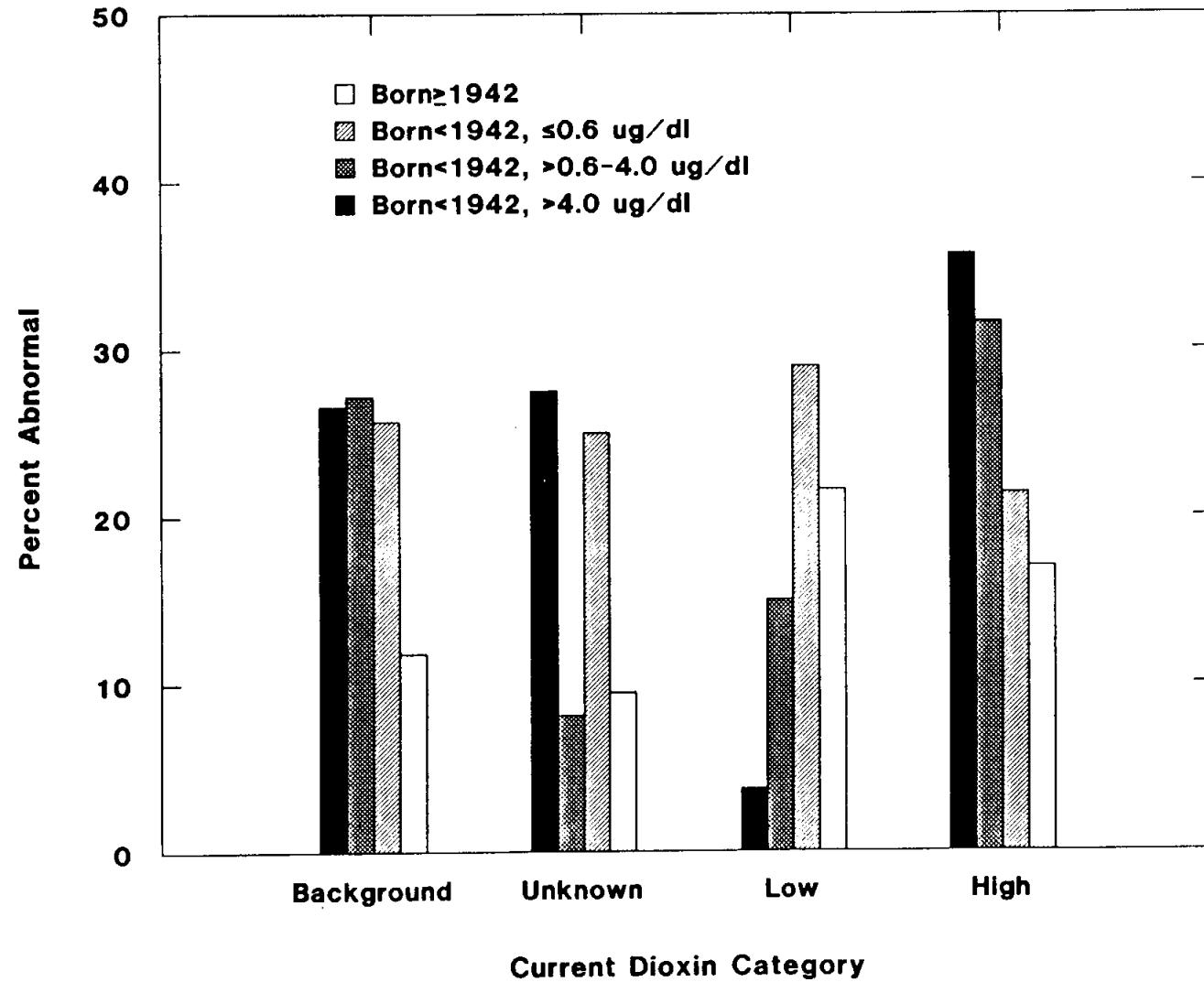


FIGURE K-2-14. Interaction of Categorized Current Dioxin, Age, and Differential Cortisol Response for Systolic Blood Pressure (Discrete)

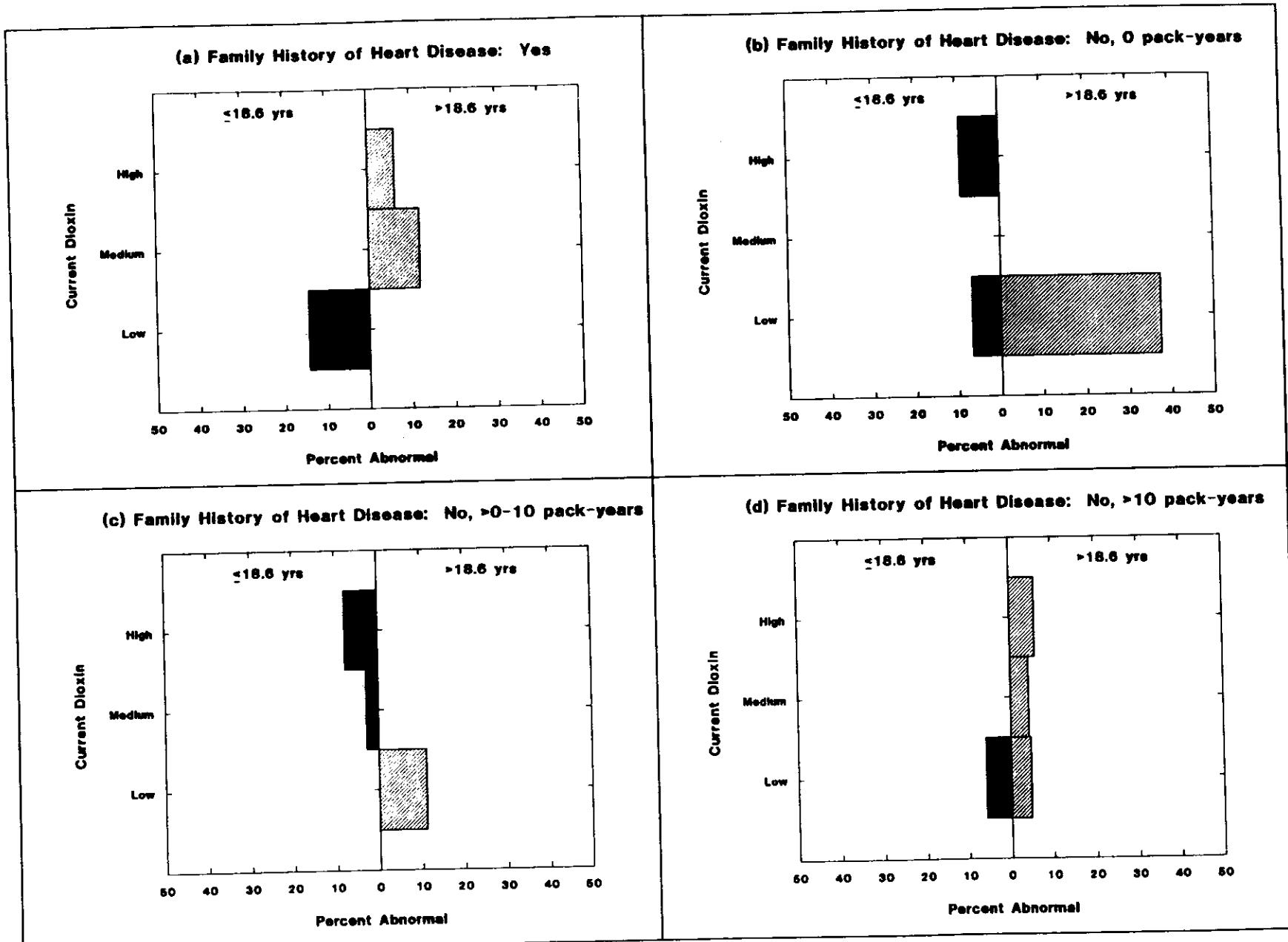


FIGURE K-2-15. Interaction of Current Dioxin, Time, Family History of Heart Disease, and Lifetime Cigarette Smoking History for Heart Sounds (Ranch Hands, Minimal Assumption)

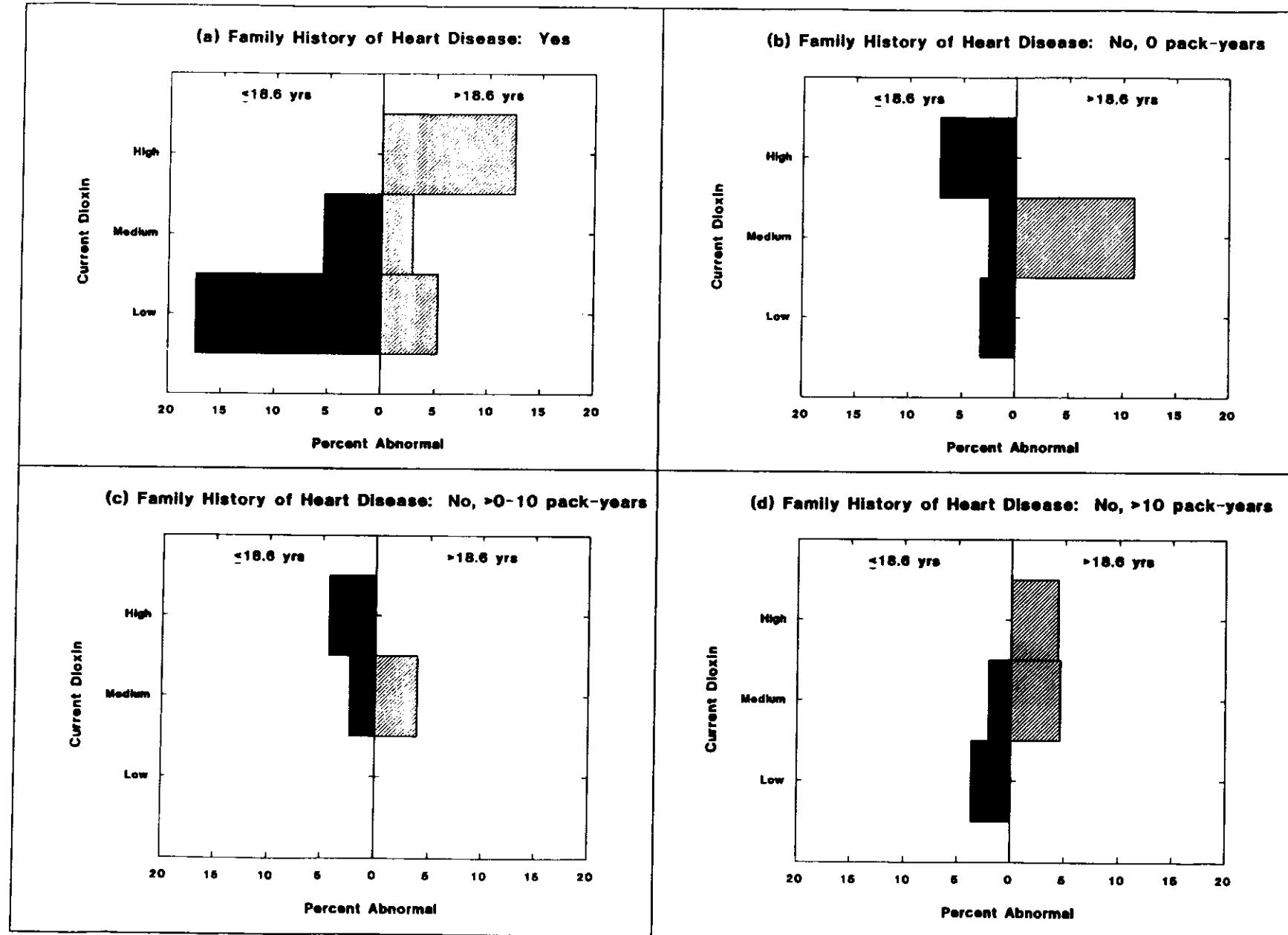


FIGURE K-2-16. Interaction of Current Dioxin, Time, Family History of Heart Disease, and Lifetime Cigarette Smoking History for Heart Sounds (Ranch Hands, Maximal Assumption)

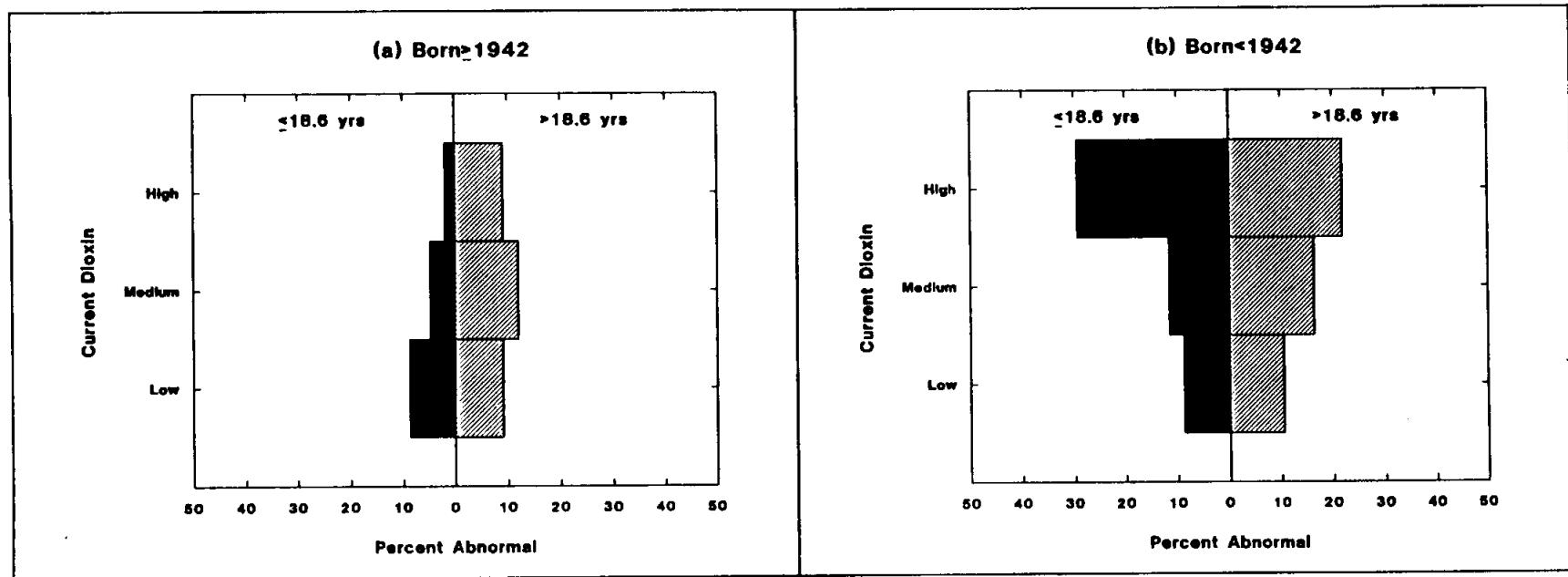


FIGURE K-2-17. Interaction of Current Dioxin, Time, and Age for ECG: Nonspecific ST- and T-Wave Changes (Ranch Hands, Maximal Assumption)

K-2-21

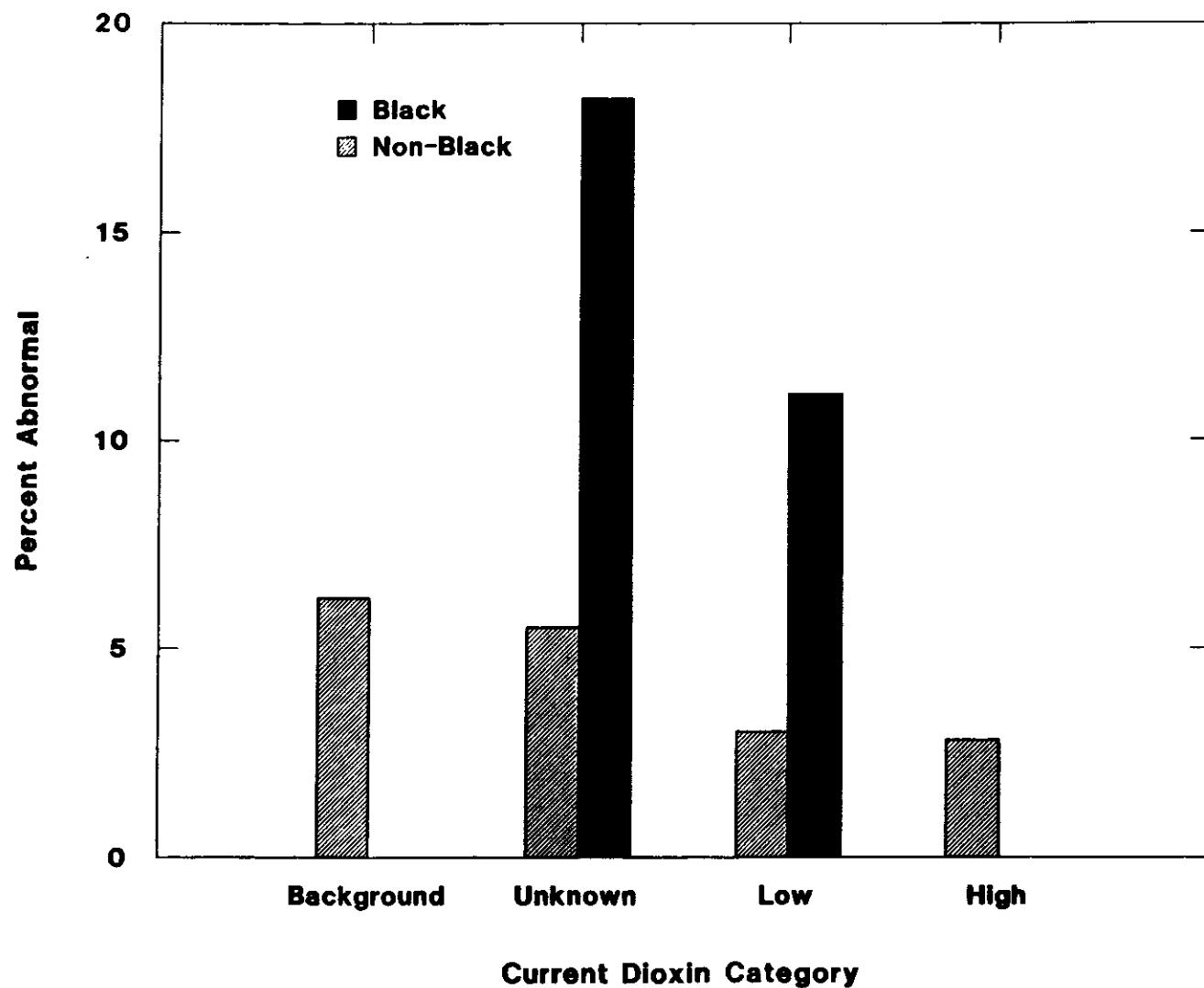
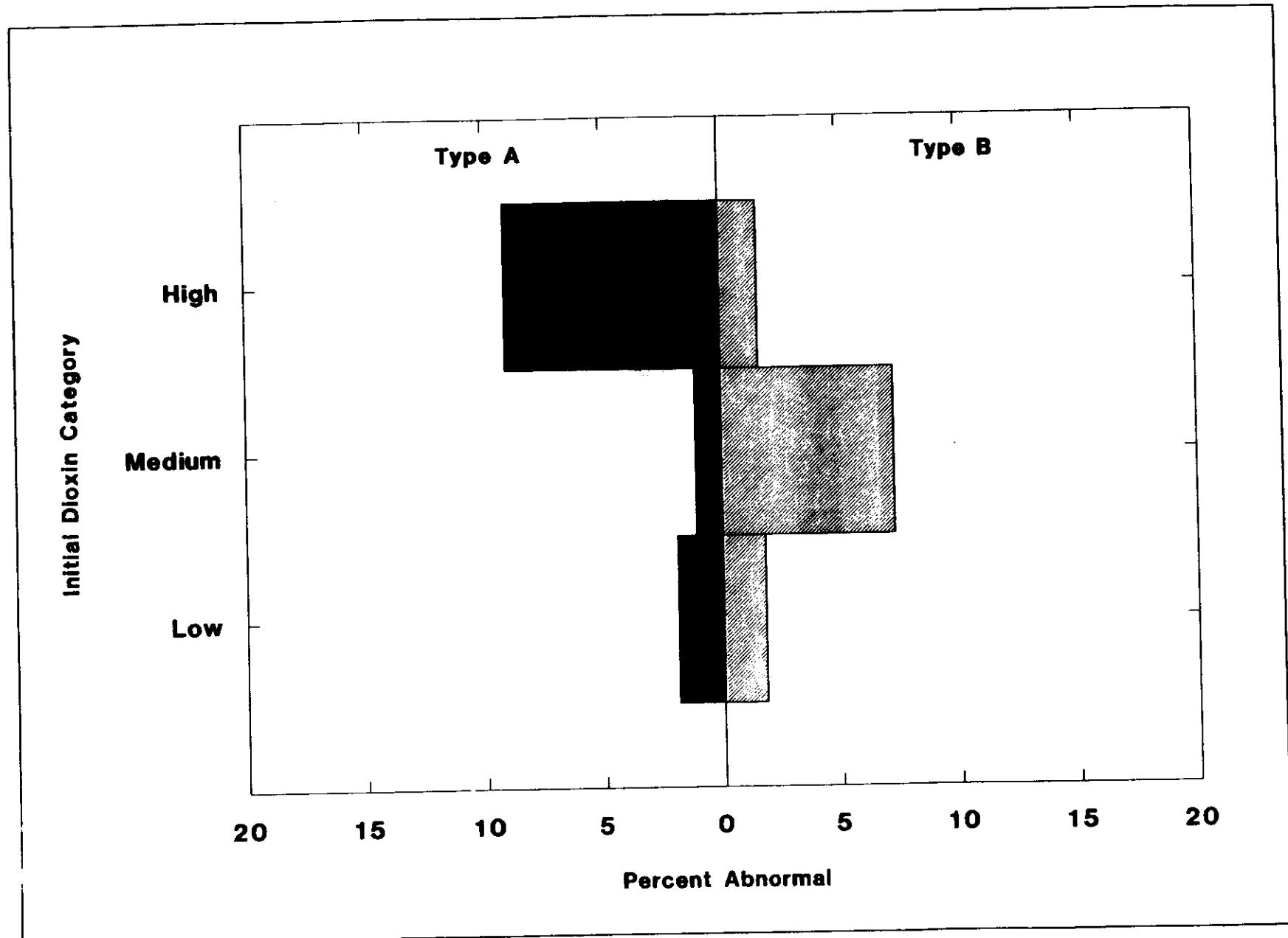


FIGURE K-2-18. Interaction of Categorized Current Dioxin and Race for ECG: Bradycardia

K-2-22



**FIGURE K-2-19. Interaction of Initial Dioxin and Personality Type for
ECG: Arrhythmia (Ranch Hands, Minimal Assumption)**

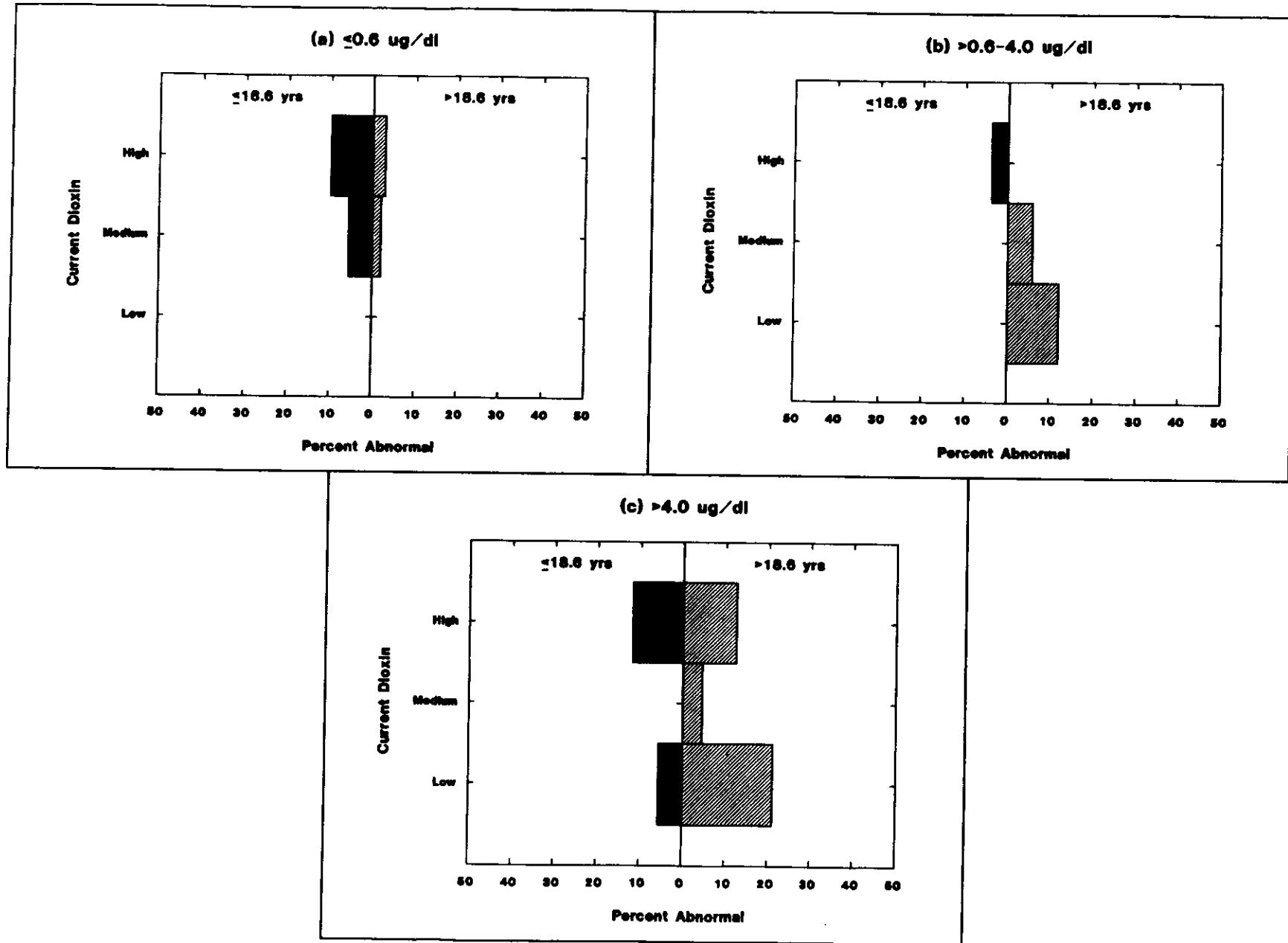


FIGURE K-2-20. Interaction of Current Dioxin, Time, and Differential Cortisol Response for ECG: Arrhythmia (Ranch Hands, Maximal Assumption)

K-2-24

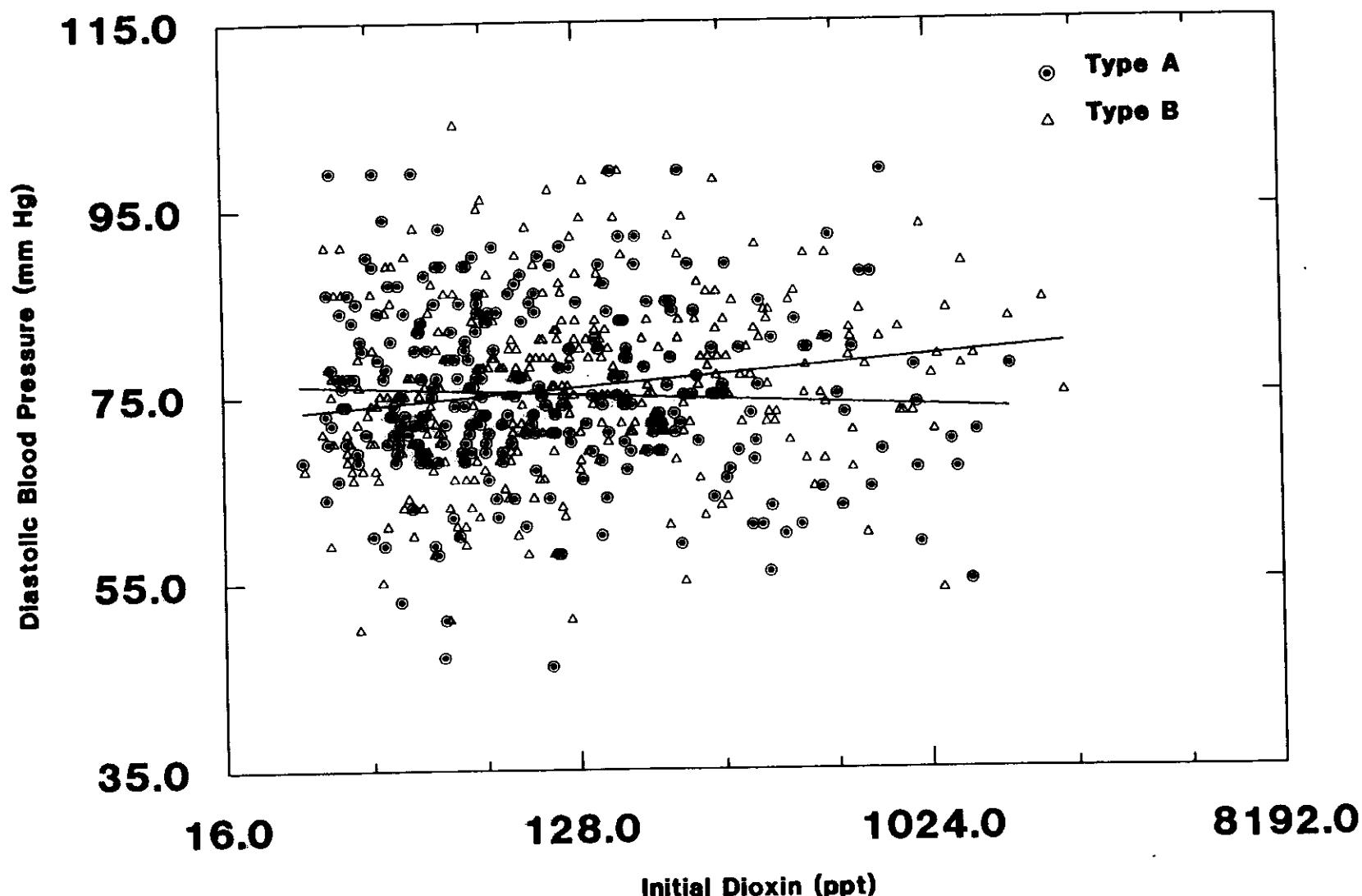


FIGURE K-2-21. Interaction of Initial Dioxin and Personality Type for Diastolic Blood Pressure (Continuous - Ranch Hands, Maximal Assumption)

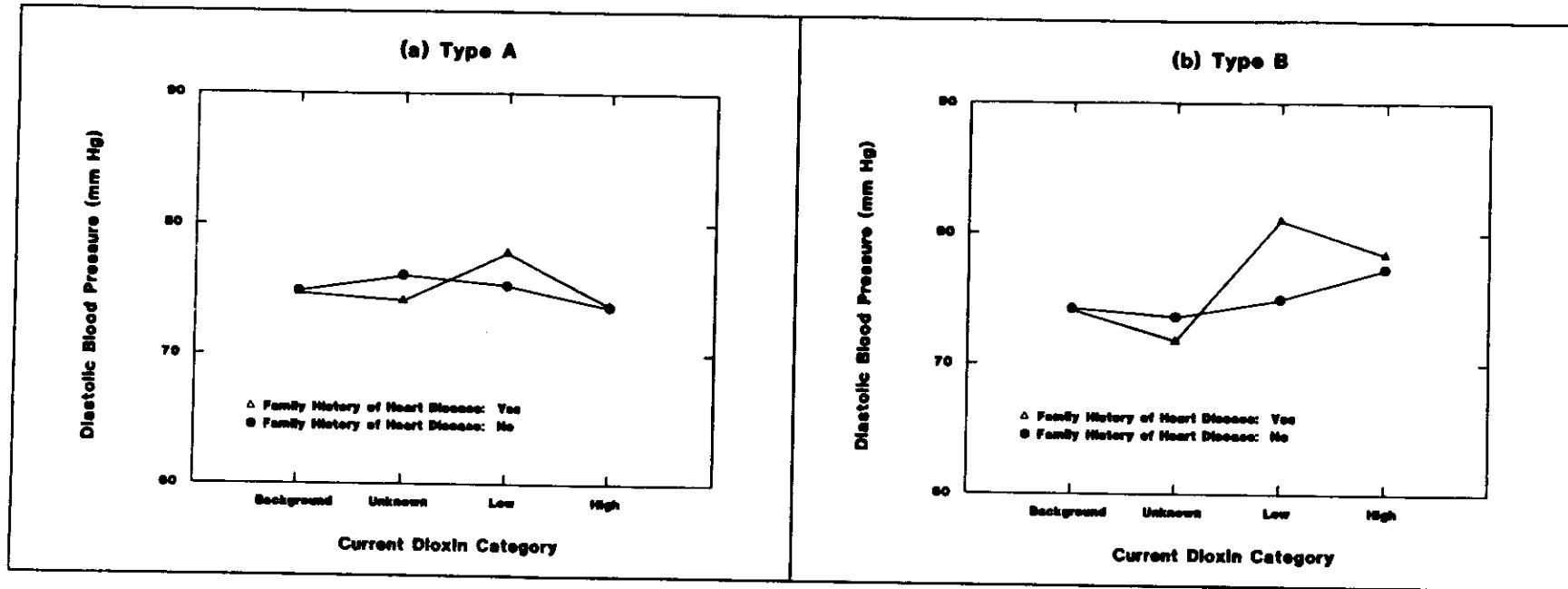


FIGURE K-2-22. Interaction of Categorized Current Dioxin, Personality Type, and Family History of Heart Disease for Diastolic Blood Pressure (Continuous)

K-2-26

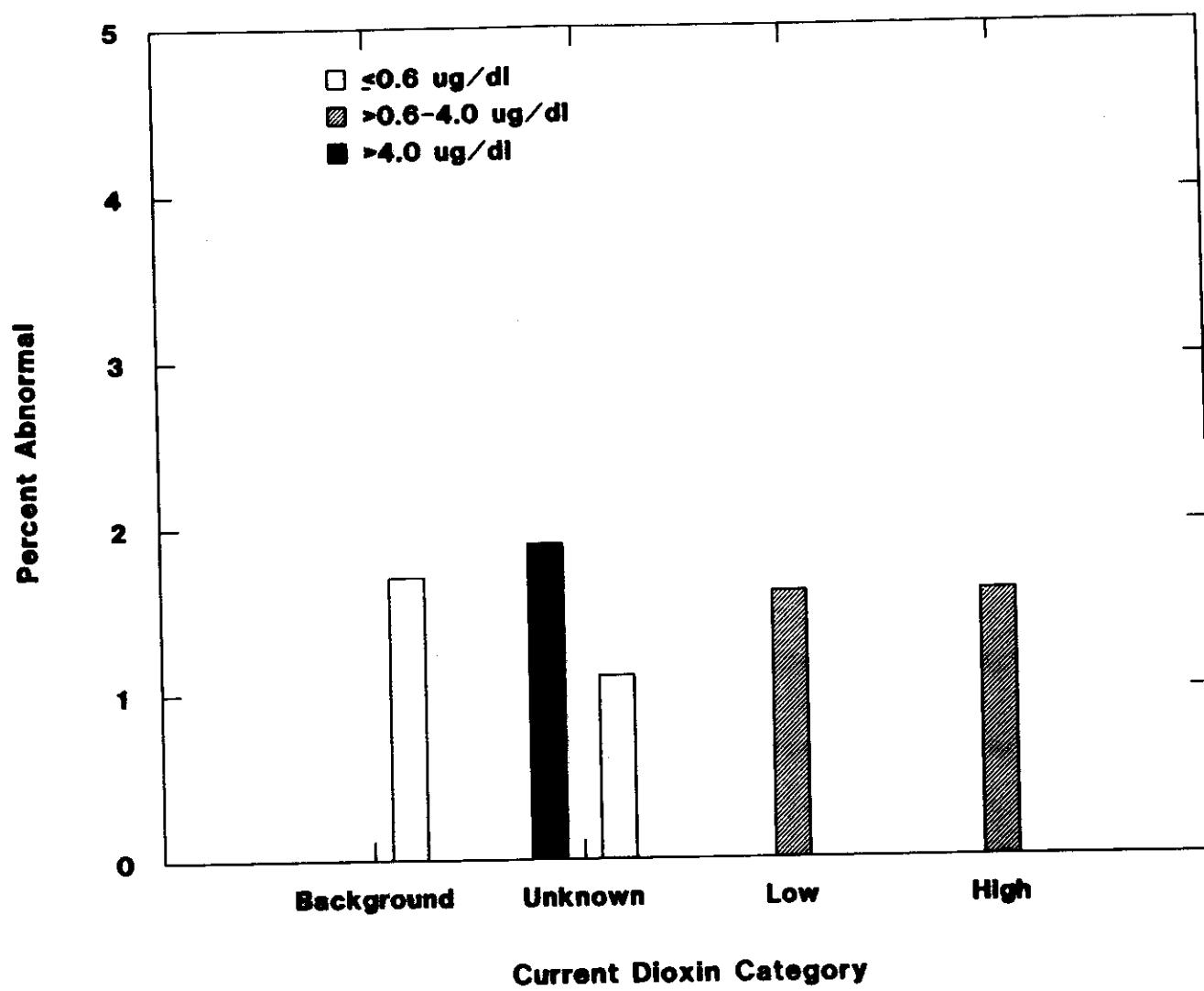


FIGURE K-2-23. Interaction of Categorized Current Dioxin and Differential Cortisol Response for Funduscopic Examination

K-2-27

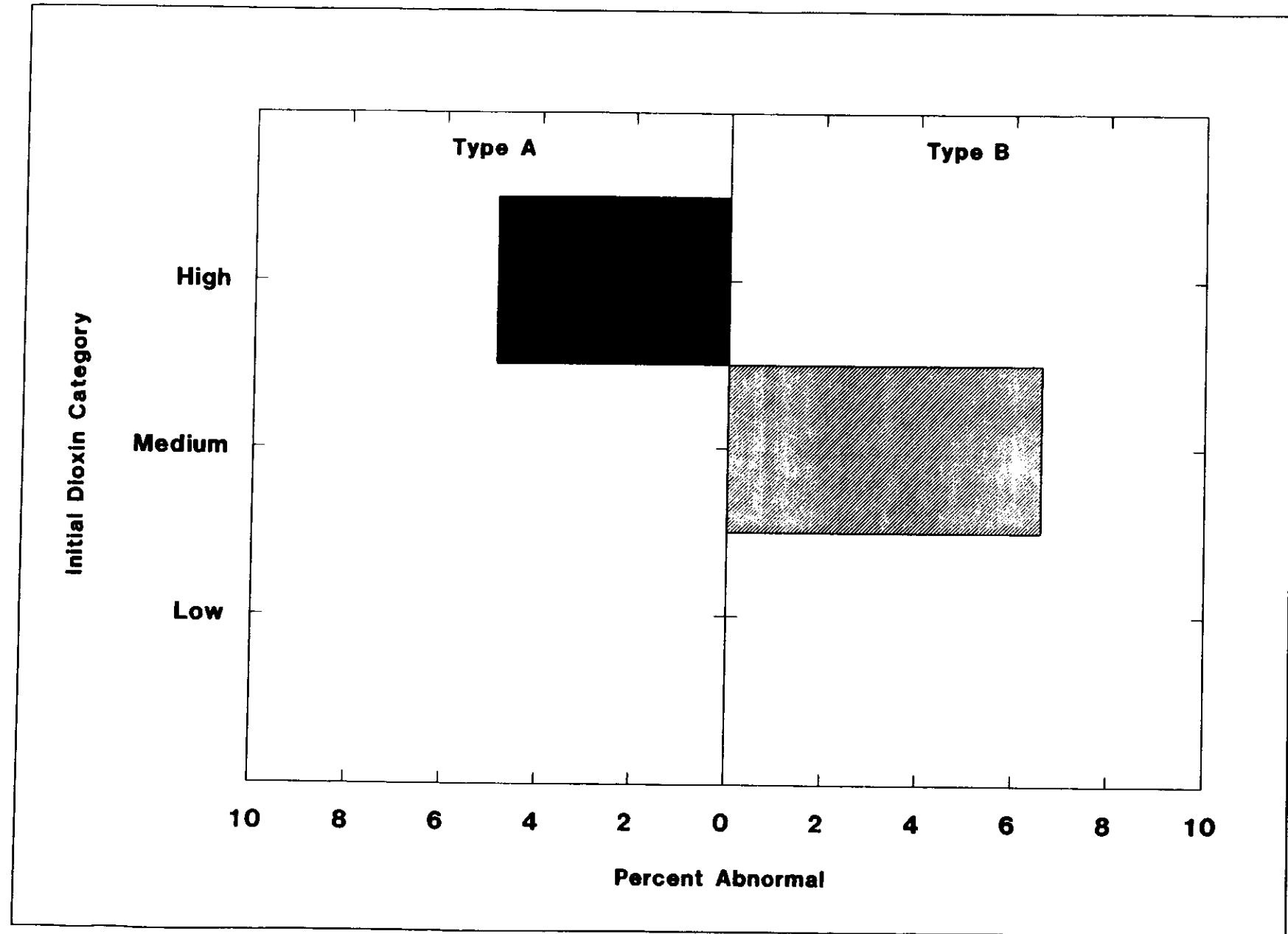


FIGURE K-2-24. Interaction of Initial Dioxin and Personality Type for Femoral Pulses (Ranch Hands, Minimal Assumption)

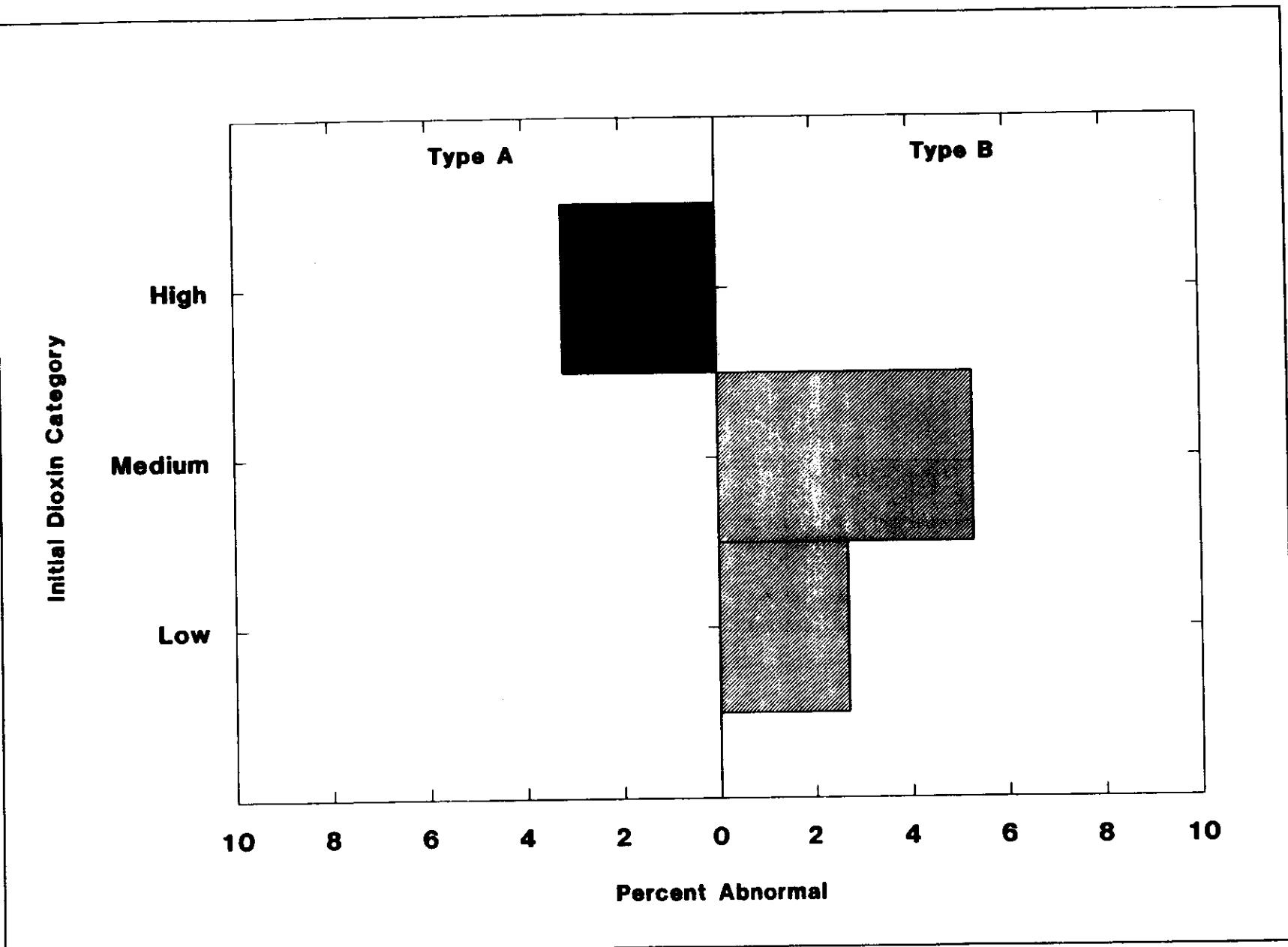


FIGURE K-2-25. Interaction of Initial Dioxin and Personality Type for Femoral Pulses (Ranch Hands, Maximal Assumption)

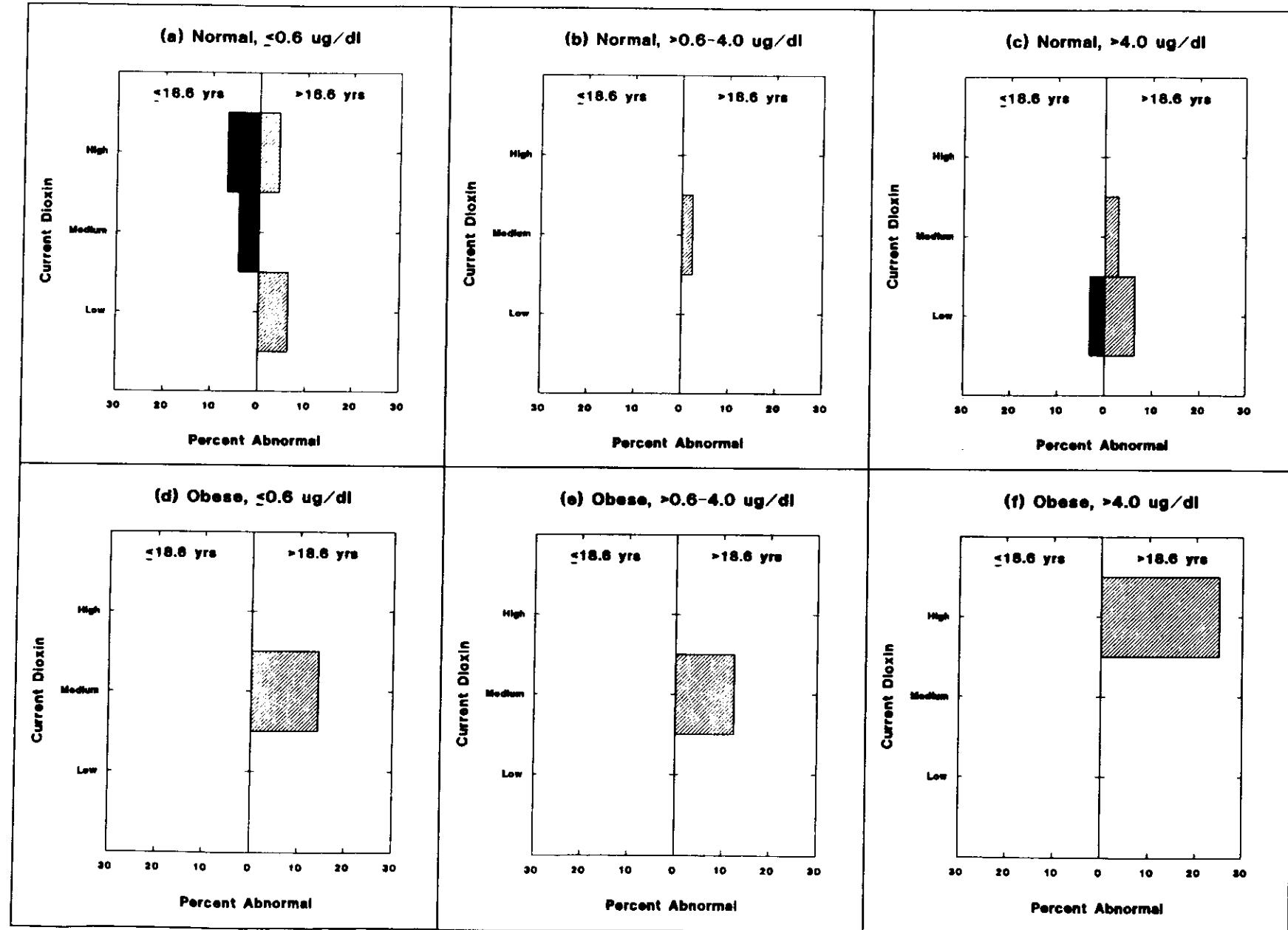


FIGURE K-2-26. Interaction of Current Dioxin, Time, Percent Body Fat, and Differential Cortisol Response for Femoral Pulses (Ranch Hands, Maximal Assumption)

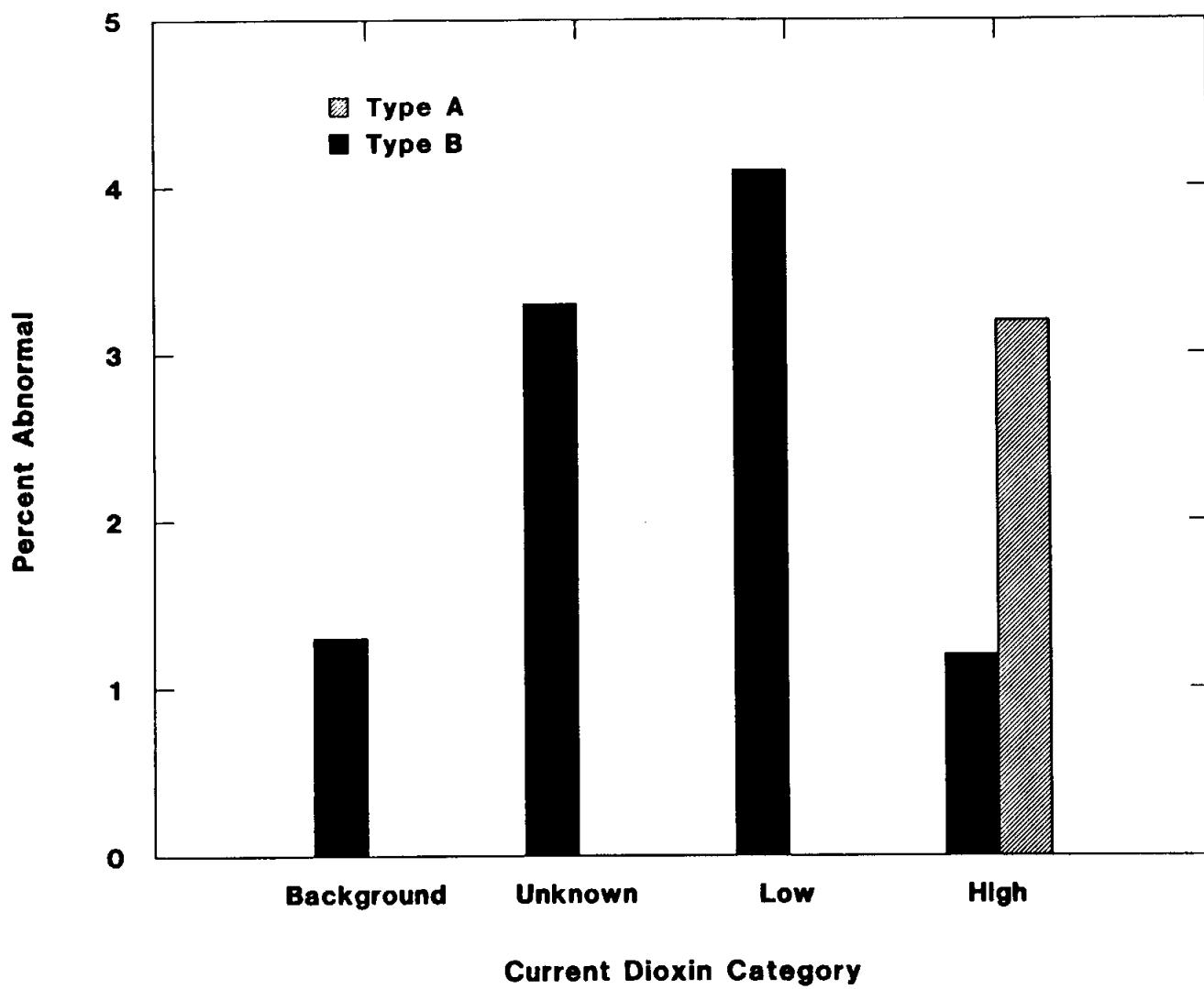


FIGURE K-2-27. Interaction of Categorized Current Dioxin and Differential Cortisol Response for Femoral Pulses

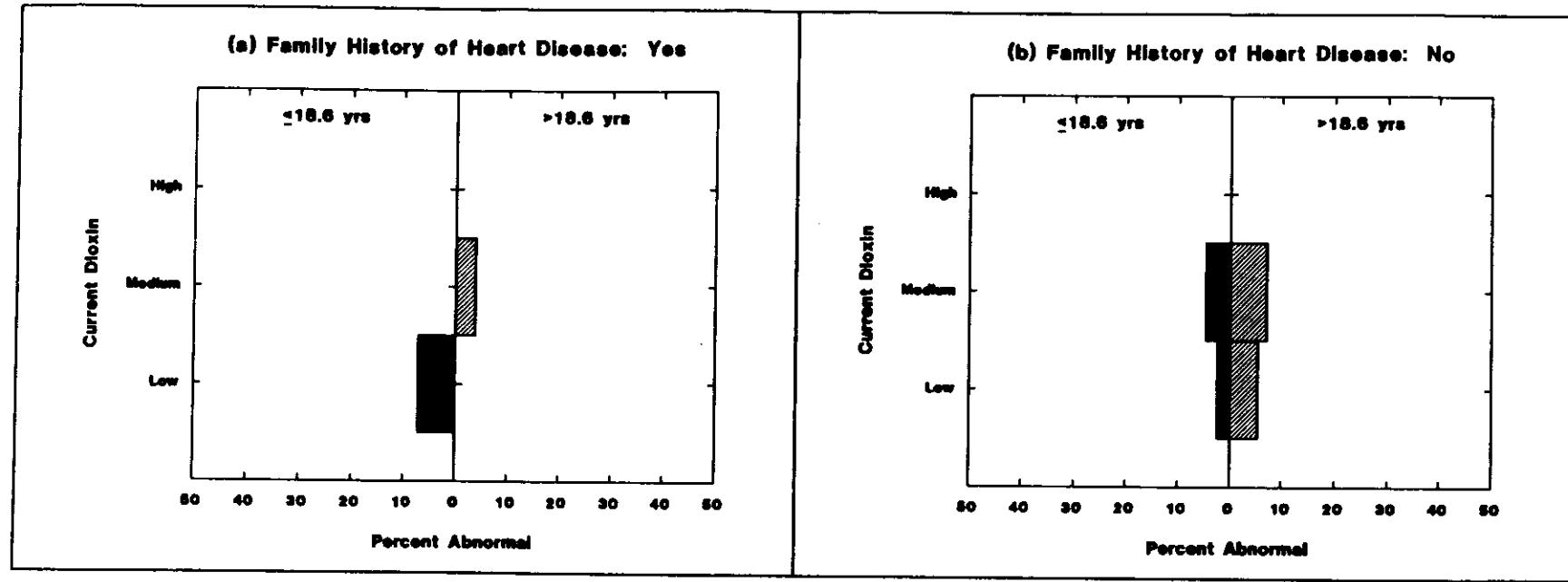


FIGURE K-2-28. Interaction of Current Dioxin, Time, and Family History of Heart Disease for Popliteal Pulses (Ranch Hands, Minimal Assumption)

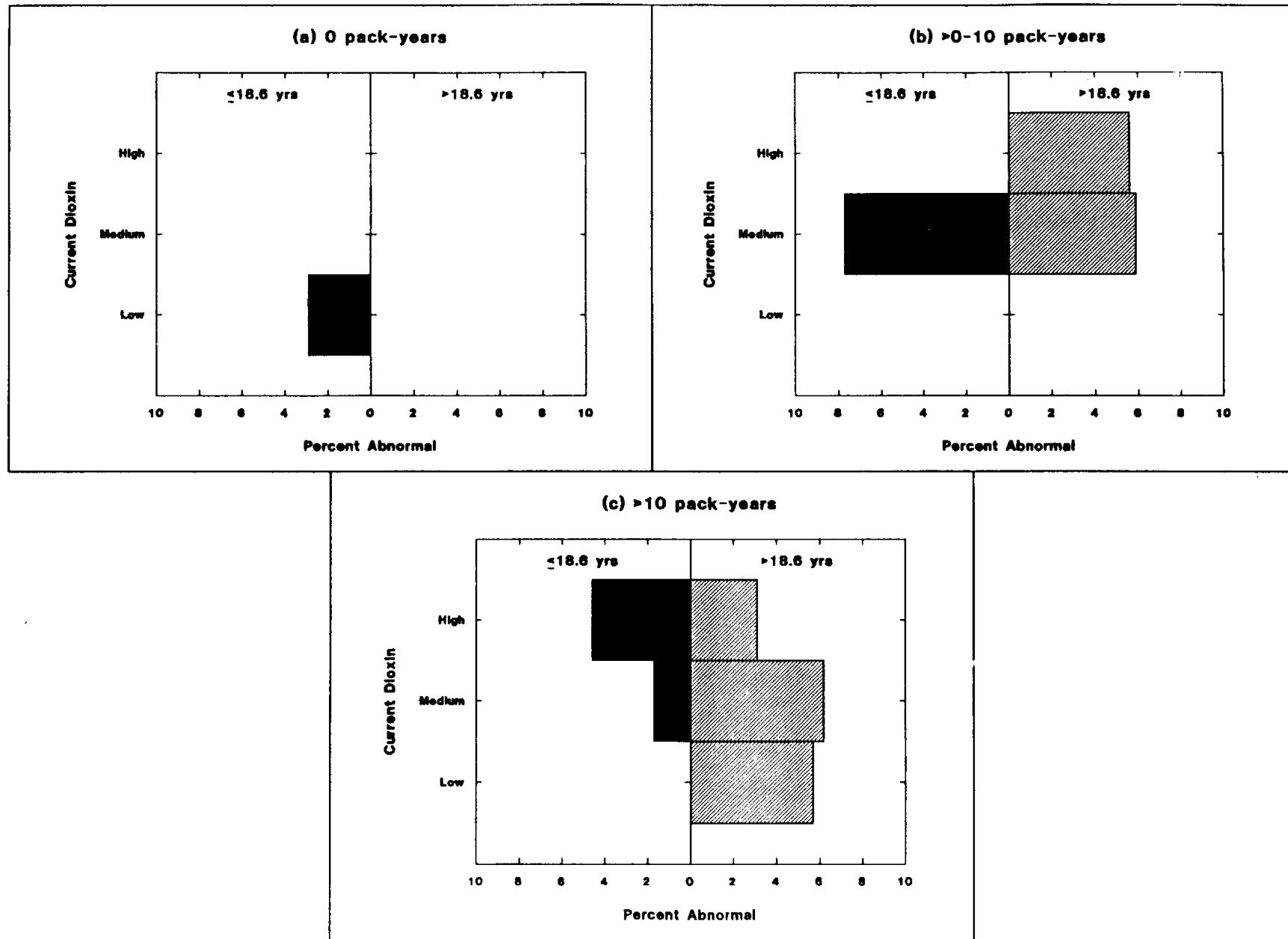


FIGURE K-2-29. Interaction of Current Dioxin, Time, and Lifetime Cigarette Smoking History for Popliteal Pulses (Ranch Hands, Maximal Assumption)

K-2-33

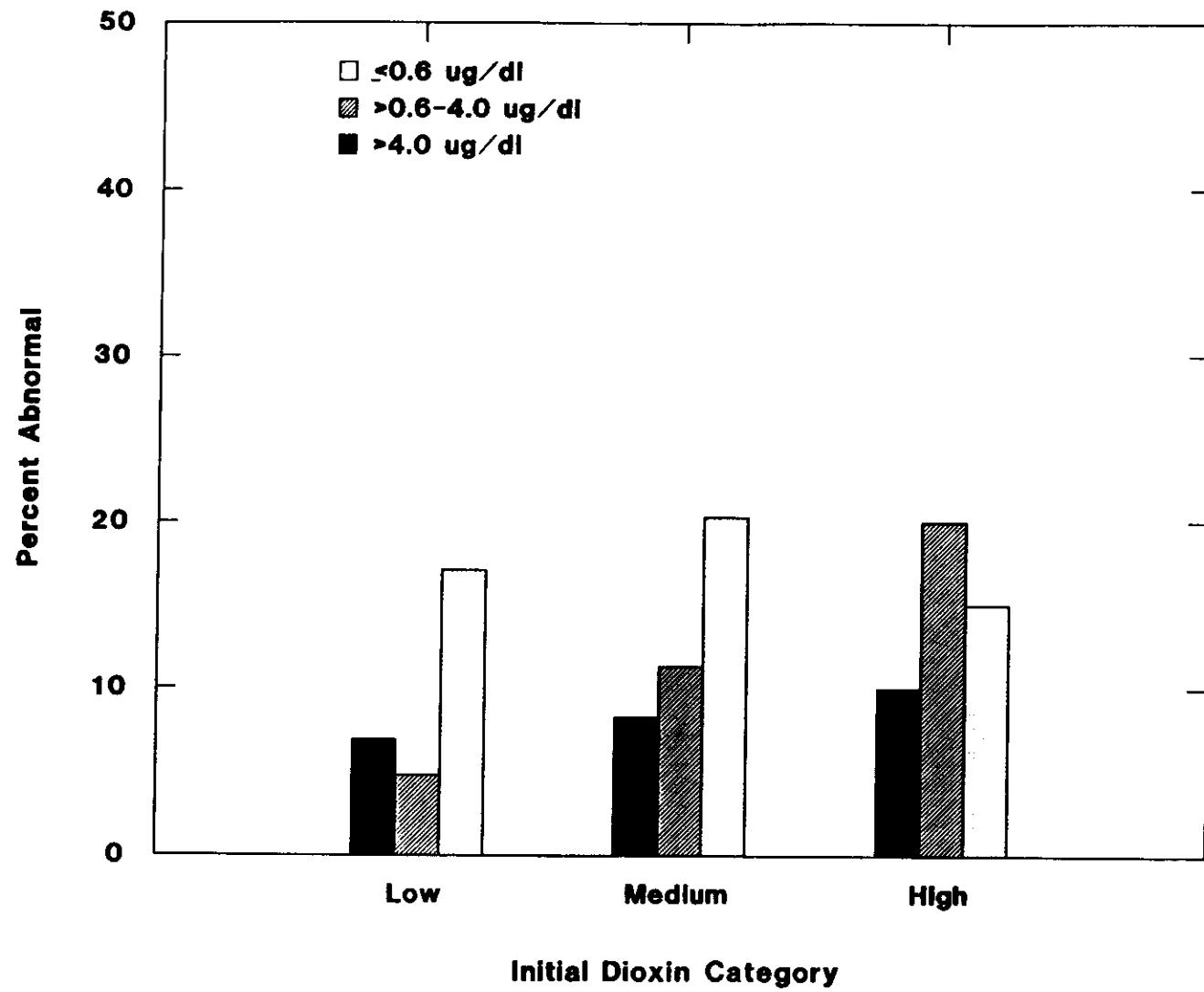
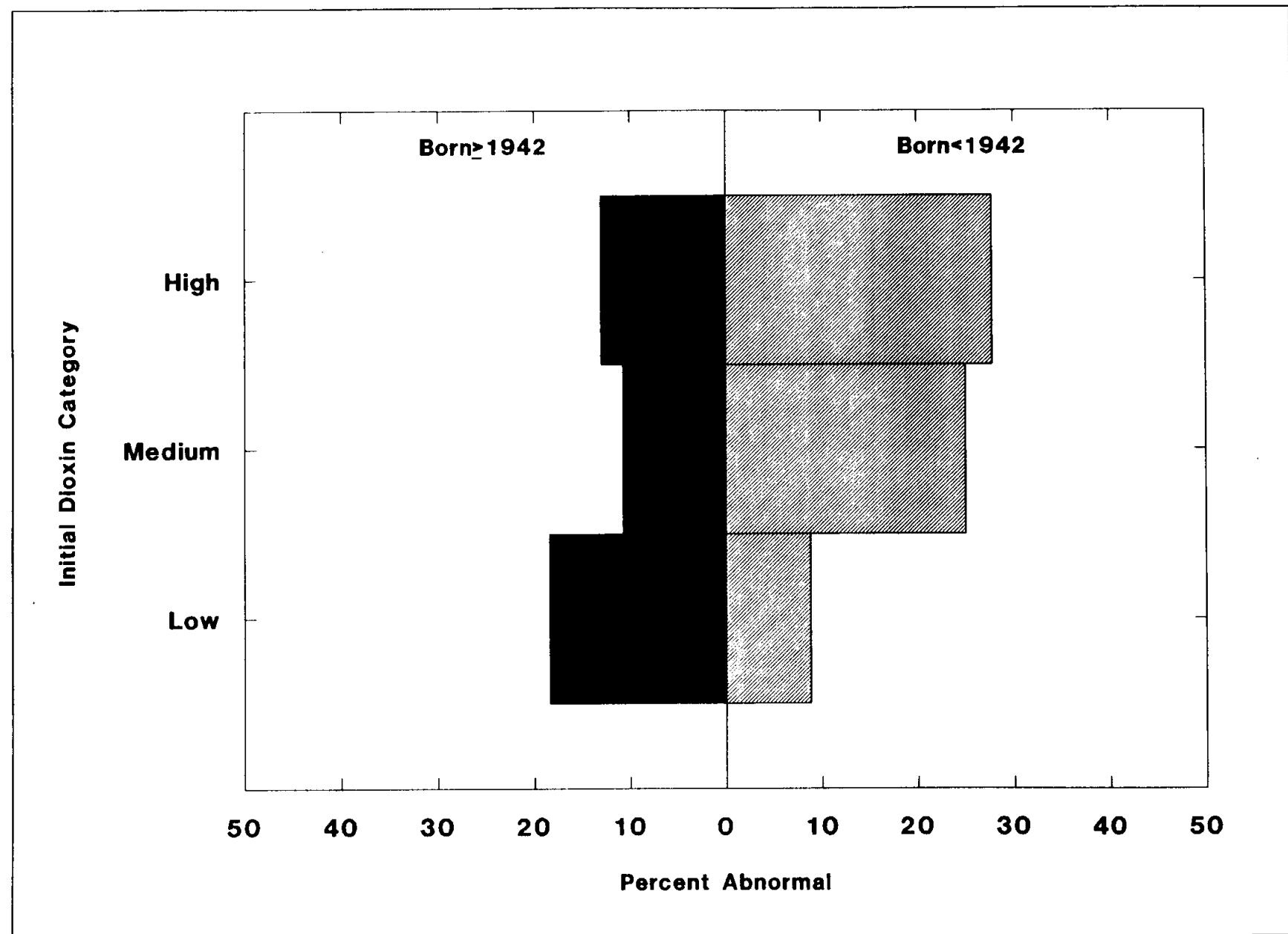


FIGURE K-2-30. Interaction of Initial Dioxin and Differential Cortisol Response for Dorsalis Pedis Pulses (Ranch Hands, Minimal Assumption)

K-2-34



**FIGURE K-2-31. Interaction of Initial Dioxin and Age for Leg Pulses
(Ranch Hands, Minimal Assumption)**

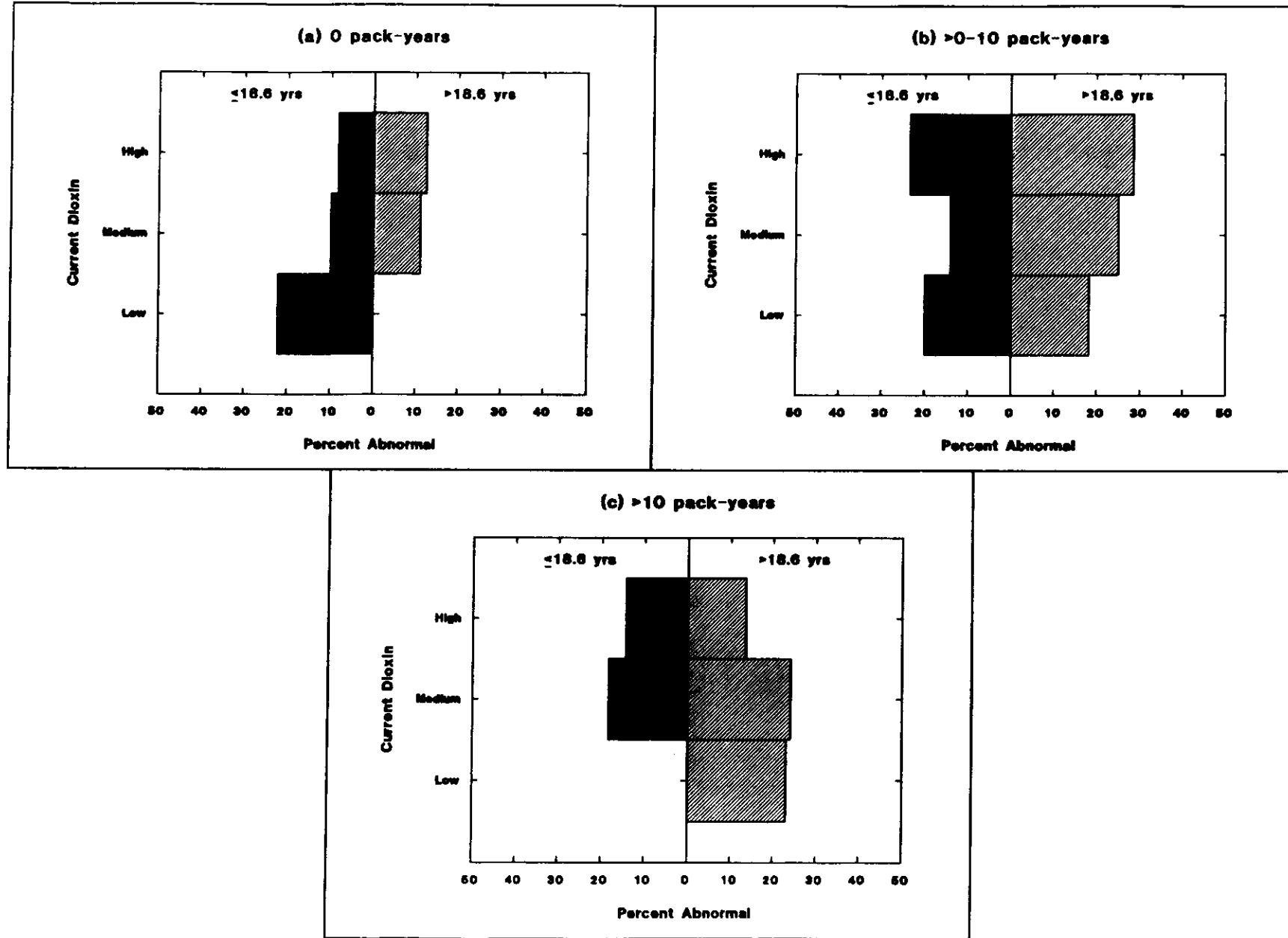


FIGURE K-2-32. Interaction of Current Dioxin, Time, and Lifetime Cigarette Smoking History for Leg Pulses (Ranch Hands, Minimal Assumption)

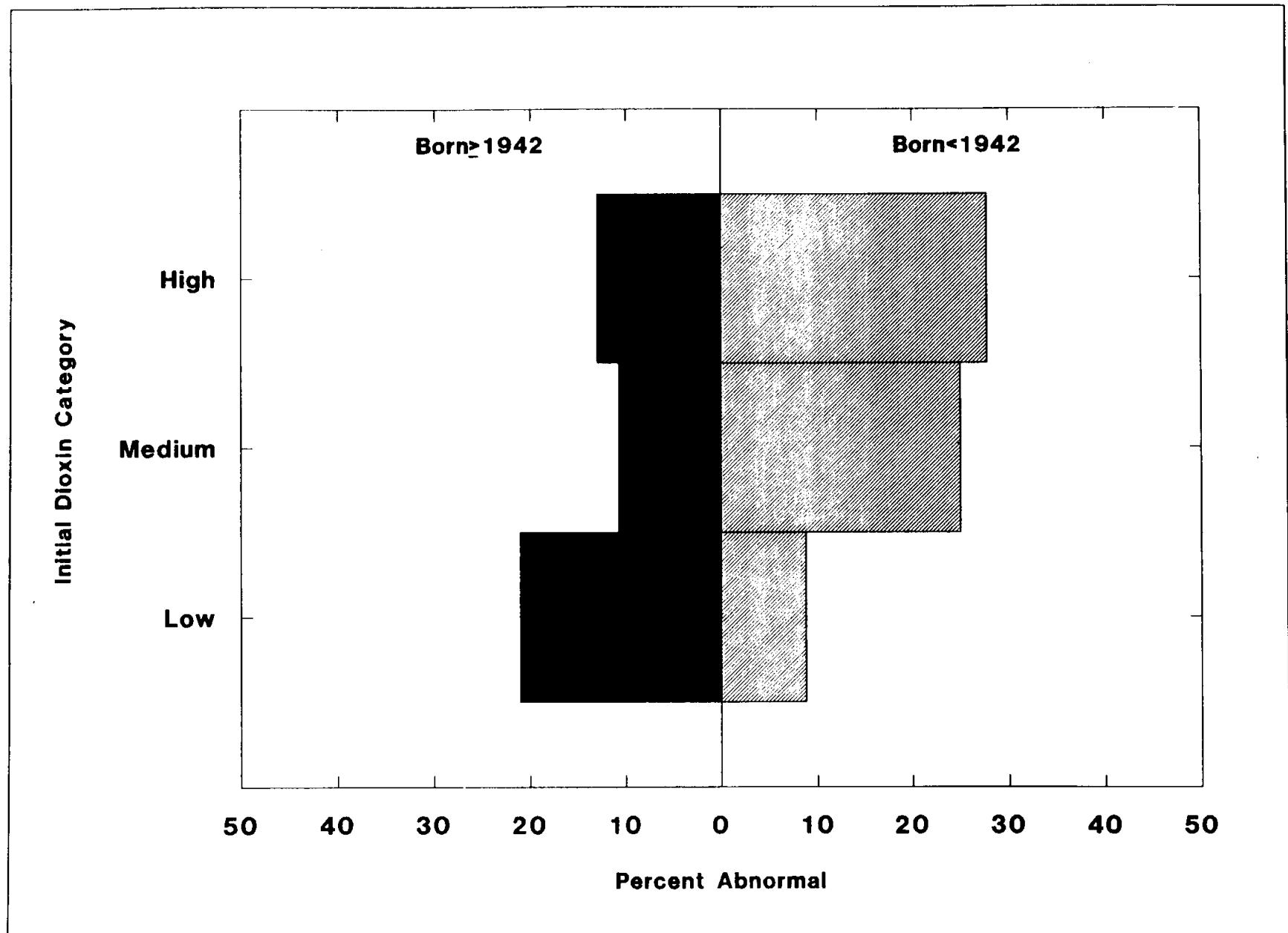


FIGURE K-2-33. Interaction of Initial Dioxin and Age for Peripheral and All Pulses
(Ranch Hands, Minimal Assumption)

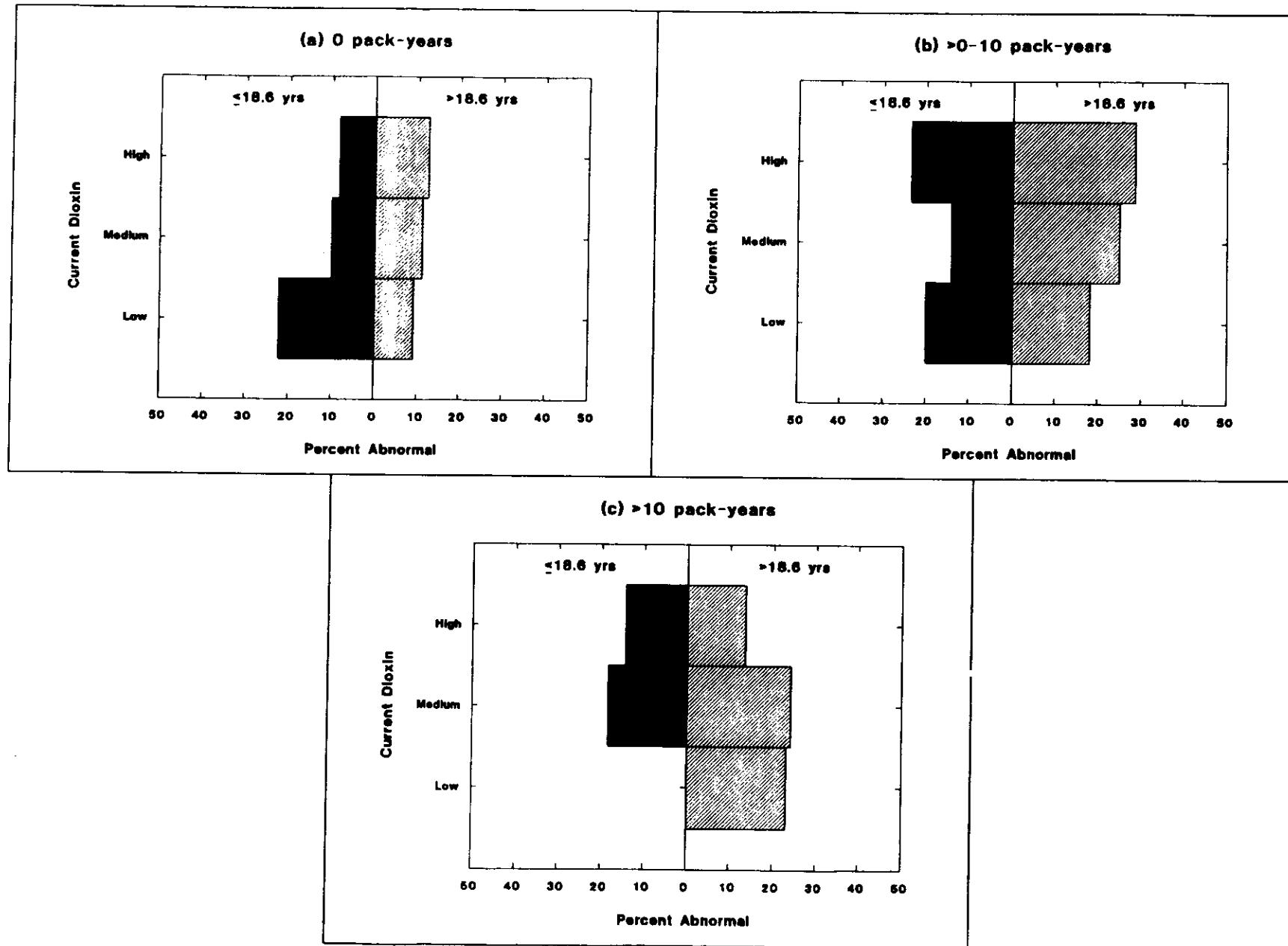


FIGURE K-2-34. Interaction of Current Dioxin, Time, and Lifetime Cigarette Smoking History for Peripheral and All Pulses (Ranch Hands, Minimal Assumption)